Technical Committee on Hyperbaric and Hypobaric Facilities (HEA-HYP)

M E M O R A N D U M

DATE: July 31, 2012

TO: Principal and Alternate Members of the Technical Committee on Hyperbaric and Hypobaric Facilities (HEA-HYP)

FROM: Jon Hart, Associate Fire Protection Engineer/NFPA Staff Liaison

SUBJECT: **AGENDA PACKAGE– NFPA 99 and NFPA 99B First Draft Meeting (A2014)**

Enclosed is the agenda for the NFPA 99 and NFPA 99B First Draft meeting of the Technical Committee on Hyperbaric and Hypobaric Facilities, which will be held on **Monday, August 20, 2012 and Tuesday, August 21, 2012 at the Sheraton Suites San Diego at Symphony Hall**. Please review the attached comments in advance, and if you have alternate suggestions, please come prepared with proposed language and respective substantiation.

If you have any questions prior to the meeting, please do not hesitate to contact me at:

Office: (617) 984-7470
Email: jhart@nfpa.org

For administrative questions, please contact Elena Carroll at (617) 984-7952.

I look forward to working with everyone.

Technical Committee on Hypobaric and Hyperbaric Facilities (HEA-HYP)

NFPA 99 First Draft Meeting (Annual 2014)
Monday, August 20, 2012 + Tuesday, August 21, 2012
Sheraton Suites San Diego at Symphony Hall
701 A Street, San Diego, California 92101

AGENDA

Monday, August 20, 2012 – Tuesday, August 21, 2012

1. Call to Order – 8:00 am (8/20)

2. Introductions and Attendanc**e**

3. Chairman Comments

4. Approval of Previous Meeting Minutes

5. Staff Liaison Presentation on NFPA's new Revision Process and A2014 Cycle

6. Review of Correlating Committee Minutes

7. Preparation of the First Draft
   - Review Public Input
   - Create First Revisions

8. New Business

9. Discuss dates for the TC Second Draft

10. Adjournment – (8/21)

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701 A Street, San Diego, California 92101

Key Dates for the Annual 2014 Revision Cycle

Public Input Closing Date	June 22, 2012
Final Date for First Draft Meeting	**August 31, 2012**
Ballots Mailed to TC before	October 12, 2012
Ballots Returned By	**November 2, 2011**
Correlating Committee First Draft Meeting	December 11, 2012
Final First Draft Posted	**February 22, 2013**
Public Comment Closing Date	May 3, 2013
Final Date for Second Draft Meeting	**July 12, 2013**
Correlating Committee Second Draft Meeting by	November 8, 2013
Final Second Draft Posted	January 3, 2014
Closing Date for Notice of Intent to Make a Motion (NITMAM)	February 7, 2014
Issuance of Consent Document (No NITMAMs)	*May 9, 2014*
NFPA Annual Meeting (Las Vegas)	June 2014
Issuance of Document with NITMAM	*August 12-14, 2014*

Technical Committee deadlines are in **bold**.

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Staff Liaison Notice

Note from the Staff Liaison

Dear Technical Committee Members:

We are very pleased that you will be participating in the processing of the 2015 Edition of NFPA 99, Health Care Facilities Code. Development of this document would not be possible without the participation of volunteers like you.

Meeting Preparation

Committee members are strongly encouraged to review the published comments prior to the meeting and to be prepared to act on each item.

Handout materials should be submitted to the chair and staff liaison at least seven days prior to the meeting.

Only one posting of the Public Input will be made; it will be arranged in section/order and will be pre-numbered. This will be posted to the NFPA 99 Document Information page (www.nfpa.org/99) under the "Next Edition" tab. If you have trouble accessing the website please contact Elena Carroll at ecarroll@nfpa.org.

Mandatory Materials:

- Last edition of the standard
- Meeting agenda
- Public Input
- Committee Officers' Guide (Chairs)
- Roberts' Rules of Order (Chairs; An abbreviated version may be found in the Committee Officer's Guide)

Optional Materials:

- NFPA Annual Directory
- NFPA Manual of Style

Technical Committee on Hypobaric and Hyperbaric Facilities (HEA-HYP)

NFPA 99 First Draft Meeting (Annual 2014)

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Regulations and Guiding Documents

All committee members are expected to behave in accordance with the Guide for the Conduct of Participants in the NFPA Codes and Standards Development Process.

All actions during and following the committee meetings will be governed in accordance with the NFPA Regulations Governing Committee Projects. Failure to comply with these regulations could result in challenges to the standards-making process. A successful challenge on procedural grounds could prevent or delay publication of the document.

The style of the document must comply with the Manual of Style for NFPA Technical Committee Documents.

Distribution by %

HEA-HYP Hyperbaric and Hypobaric Facilities

Name	Company	Representation	Class	Office
Peter Atkinson	Royal Brisbane and Womens Hospital	HTNA	C	Principal
	Voting Number 1		**Percent** 6%	
Angela M. Fuqua	Chubb Group Insurance Companies		I	Principal
	Voting Number 1		**Percent** 6%	
Rachael Sheets	The Linde Group		IM	Principal
John M. Skinner	Medical Equipment Technology, Inc.		IM	Principal
	Voting Number 2		**Percent** 11%	
W. Robert Bryant	Perry Baromedical Corporation		M	Principal
Keith Ferrari	Praxair, Inc.		M	Principal
W. T. Gurnée	OxyHeal Health Group		M	Principal
Stephen D. Reimers	Reimers Systems, Inc.		M	Principal
Deepak Talati	Sechrist Industries, Inc.		M	Principal
	Voting Number 5		**Percent** 28%	
Richard C. Barry	Diversified Clinical Services & National Healing		SE	Principal
Mario Caruso	Comprehensive Healthcare Solutions, Inc.		SE	Principal
Barry E. Newton	Wendell Hull & Associates, Inc.		SE	Principal
	Voting Number 3		**Percent** 17%	
Robert B. Sheffield	International ATMO, Inc.		U	Chair
Michael W. Allen	Life Support Technologies Group Inc.		U	Principal
Chad E. Beebe	ASHE - AHA	ASHE	U	Principal
James Bell	Intermountain Health Care		U	Principal
William C. Gearhart	University of Maryland Medical Systems		U	Principal
Wilbur T. Workman	Undersea & Hyperbaric Medical Society	UHMS	U	Principal
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TC on Hyperbaric Facilities
Drury Plaza Hotel – San Antonio Riverwalk
105 South St. Mary's Street
San Antonio, TX 78205
October 14, 2010

Attendees:

Robert Sheffield
Richard Barry
James Bell
Mario Caruso
Angela Fuqua
Barry Newton
Stephen Reimers
Guenell Shiffuala
Rachel Sheets
John Skinner

Jon Levin

1. Rob Sheffield called the meeting to order. He stated we have public comments to review for this meeting.

2. Jon Levin gave the staff report. He reviewed the dates of the cycle and the actions the committee can take at the ROC meeting.

3. The minutes of the previous ROP meeting were approved.

4. The committee then acted on the public and committee Comments. See the ROC for the official action on the comments.

5. There was no old business.

6. There was no new business.

7. Next meeting. TBD.
8. Meeting adjourned at 5:00 pm.

99- Log #327 HEA-HYP Final Action:
(3.2.x Acute Care, Non-acute Care (New))

Submitter: Keith Ferrari, Praxair, Inc.
Recommendation: Add new definitions to read:
Acute Care. Acute careis a branch of secondary health care where a patient receives active but short-term treatment for a severe injury or episode of illness, an urgent medical condition, or during recovery from surgery. In medical terms, care for acute health conditions is the opposite from chronic care, or longer term care. (HYP)
Non-acute Care. Short term care of those that do not meet the definitions for acute care. (HYP)
Substantiation: Chapter 14 defines oxygen systems depending on acute vs non acute treatment, but there is no definition of acute or non acute in the definition section of NFPA 99.

99- Log #222 HEA-HYP Final Action:
(3.3.123 Noncombustible (Material))

Submitter: Marcelo M. Hirschler, GBH International
Recommendation: Revise text to read:
3.3.123 Noncombustible (Material). See 4.4.1.1 ~~A material that, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors, when subjected to fire or heat. Materials that are reported as passing ASTM E 136, *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C,* shall be considered noncombustible materials. (HYP)~~

Substantiation: This change puts NFPA 99 in line with what was done for NFPA 101 (and many other documents) in the 2012 cycle. NFPA requirements are that definitions cannot contain requirements and the definitions of noncombustible and limited combustible contain requirements. Therefore this public input proposes to put simply a place holder in chapter 3 (definitions) and place the requirements into Chapter 4 (fundamentals), just as was done in NFPA 101 and 5000. The proposed language is identical to the language in NFPA 101. If the technical committee wishes it can simply extract the language from NFPA 101. The corresponding sections are: 3.3.96 would be extracted from 3.3.169.2, 3.3.123 would be extracted from 3.3.169.4, 4.4.1 would be extracted from 4.6.13 and 4.4.2 would be extracted from 4.6.14.

99- Log #51 HEA-HYP Final Action:
(Chapter 3)

Submitter: James Bell, Intermountain Health Care
Recommendation: Add a new section to read:
3.3.152* Qualified Person. A person who by possession of a recognized degree, certificate, or profesional standing, or by knowledge training, and experience has successfully demonstrated the ability to perform the assigned task. (HYP).
Substantiation: There is no definition in the NFPA 99 for qualified person.
See NFPA 25 chapter 3.

99- Log #347 HEA-HYP Final Action:
(Chapter 14)

Submitter: W. T. Gurnée, OxyHeal Health Group
Recommendation: Chapter 14 - Hyperbaric Facilities
Strongly concur – Under a risk based approach – all Hyperbaric chambers would require the patient to be directly ("hands on patient") accessed by medical staff personnel and be directly monitored by acute care critical care monitors that be adjusted and or altered on the spot by appropriate medically qualified personnel.
Therefore multiplace Class A chambers would be the only type authorized for acute care. Namely this type permits "hands on" patient care for the acute care or potentially acute care intervention patient. This type of chamber, having fire suppression and a safer air environment, is clearly the only choice.
Class B chambers therefore would be relegated to "non acute care" patient treatments only.
Substantiation: Impact: No code technical specifications needed other than designating Class A – Acute care and Class B – non acute care. NFPA99 Chapter 14's current text would only require a clear listing of what Class A Hyperbaric Systems must have for an acute care setting versus what Class B Hyperbaric Chambers require for a non acute care setting, i.e. rearranging the existing text appropriately.

99- Log #40 HEA-HYP Final Action:
(Chapter 14, Title)

Submitter: William Gossett, Convergent HCS
Recommendation: Change the title of the document to read:
Hyperbaric Chamber(s) and Supporting Facilities
Substantiation: My thought in the addition of "chamber(s) and supporting facilities" was to distinguish between two separate areas of codes and standards, i.e., the chamber itself and the building or structure enclosing the chamber, along with the facility's administrative structure and support.

99- Log #360 HEA-HYP Final Action:
(14.2.1.2)

Submitter: Richard C. Barry, Diversified Clinical Services & National Healing
Recommendation: Revise text to read:
A hydraulically calculated automatic wet pipe sprinkler system meeting the requirements of NFPA 13, Standard for the Installation of Sprinkler Systems, or a clean agent fire suppression system meeting the requirements of NFPA, Standard, shall be installed in the room housing a Class A, Class B, or Class C chamber and in any ancillary equipment rooms.
Substantiation: New technology of clean agent fire suppression systems allow for chamber operators to manually activate the FSS and to remain in the chamber room while excavating the patient. Use of the clean agent system is less costly to the end user should renovation be a factor.

99- Log #145 HEA-HYP Final Action:
(14.2.1.4.4(a))

Submitter: Jim Lucas, Tri-Tech Medical Inc.
Recommendation: Add a new subsection to read:
14.2.1.4.4(a) Service valves shall be installed at each chamber to allow servicing of the chamber, patient side piping or station outlets without shutting down the entire main, riser or facility.
Substantiation: The requirement for service valves does not exist in the current code. A multi-chamber may be built without service valves requiring shut down of thecomplete facility if one of the chambers is disconnected from the piping system.
This is not original material; its reference/source is as follows:
NFPA 99, 2012 5.1.4.7

99- Log #146 HEA-HYP Final Action:
(14.2.1.4.4(b) through 14.2.1.4.4(g))

Submitter: Jim Lucas, Tri-Tech Medical Inc.
Recommendation: Add new subsections to read:
14.2.1.4.4(b) Each station outlet for medical gases shall be gas-specific, whether the outlet is threaded or is a noninterchangeable quick coupler.
14.2.1.4.4(c) Each station outlet for medical gases shall be legibly identified in accordance wtih 5.1.11.3.
14.2.1.4.4(d) Each station outlet shall be designed so that parts or components that are required to be gas specific for compliance wtih 14.2.1.4.4(b) cannot be interchanged between the station outlet for different gases.
14.2.1.4.4(e) The use of common parts in outlets, such as O-rings, fasteners, seals and shutoff poppets, shall be permitted.
14.2.1.4.4(f) Station outlets shall be permitted to be recessed or otherwise protected from damage.
14.2.1.4.4(g) If operated at a pressure in excess of 550 kPa (80 psi) the station outlets shall be a noninterchangeable threaded connection.
Substantiation: A standard has not been defined for station outlets.
This is not original material; its reference/source is as follows:
NFPA 99, 2012 5.1.5.1, 5.1.5.5, 5.1.5.7, 5.1.5.8, 5.1.5.13, and 5.1.5.15(3)

99- Log #152 HEA-HYP Final Action:
(14.2.1.4.4(h) and 14.2.1.4.4(i))

Submitter: Jim Lucas, Tri-Tech Medical Inc.
Recommendation: Add a new subsection to read:
14.2.1.4.4(h) Central Supply Systems. Medical air systems, when installed, shall comply with 5.1.3.5.
14.2.1.4.4(i) The facility staff shall develop their emergency plan to deal with the loss of medical air.
Substantiation: Medical Air (break air) is often piped also. The current code provides no provision for Medical Air (break air).
This is not original material; its reference/source is as follows:
NFPA 99, 2012 5.2.3.4 & 5.2.3.5

99- Log #144 HEA-HYP Final Action:
(14.2.1.4.4.2)

Submitter: Jim Lucas, Tri-Tech Medical Inc.
Recommendation: Revise to read:
14.2.1.4.4.2 Central Supply Systems. ~~Oxygen s~~Systems shall comply with 5.1.3.5, as applicable, except as follows:
Substantiation: Medical Air (break air) is often piped also. The current code provides no provision for Medical Air (break air).

99- Log #41 HEA-HYP Final Action:
(14.2.1.4.4.5)

Submitter: William Gossett, Convergent HCS
Recommendation: Revise to read:
14.2.1.4.4.5 Warning Systems. Oxygen systems shall comply with 5.1.9, as applicable, except that warning systems shall be permitted to be a single master/area alarm panel. The alarm panel shall be located in close proximity to the chamber's control panel to allow for easy audio and visual monitoring by the chamber operator.
Substantiation: The chamber operator should be immediately aware of any medgas alarm condition that may affect the safe operation of the hyperbaric treatment he/she is responsible for.

99- Log #42 HEA-HYP Final Action:
(14.2.1.6.4.7(1) and (2))

Submitter: William Gossett, Convergent HCS
Recommendation: Revise to read:
(1) Area and master ~~alarms are not required for~~ alarms shall be required for all acute and nonacute care chamber operations.
(2) Remote monitoring and alarms, for the medical air system, shall be located in close proximity to the operator's panel for clear audio and visual monitoring by the chamber operator.

Substantiation: Alarm Panel Location:
The chamber operator is responsible for the safe operation of chamber treatments. The requirement of remote monitoring at the operator's panel provides system data and status to the operator, which he/she should be cognizant of while operating the chamber.

Acute care verses non-acute care:
Monitoring the air system during acute care or nonacute care seems to be an equally important responsibility of the chamber operator, regardless of acuity.

99- Log #227 HEA-HYP Final Action:
(14.2.2.5)

Submitter: Marcelo M. Hirschler, GBH International
Recommendation: Revise to read:

14.2.2.5* The interior of Class A chambers shall be unfinished or treated with a finish in accordance with 14.2.2.5.1. ~~that is one of the following~~:

14.2.2.5.1* The finish material for the interior of Class A chambers shall be one of the following:

(1) ~~High quality epoxy~~ A material that, when tested in accordance with ASTM E1354, *Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter*, in the horizontal orientation, at an incident heat flux of 50 kW/m^2, using steel as a substrate, exhibits a heat release rate of no more than 200 kW/m^2

(2) A material that, when tested in accordance with NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth* , using steel as a substrate, does not exhibit flashover and exhibits a heat release rate of no more than 500 kW

(3) A limited-combustible material in accordance with 3.3.98

(4) A noncombustible ~~Noncombustible~~ material in accordance with ~~as defined in~~ 3.3.123

~~14.2.2.5.1~~ 14.2.2.5.2 If the interior of a Class A chamber is treated (painted) with a finish described ~~listed~~ in 14.2.2.5.1 ~~14.2.2.5~~, the cure procedure and minimum duration for each coat of finish to off-gas shall be in accordance with the manufacturer's application instructions and material safety data sheets.

~~14.2.2.5.2~~ 14.2.2.5.3 * If sound-deadening materials are employed within a hyperbaric chamber, they shall be limited-combustible materials in accordance with ~~as defined in~~ 3.3.98.

Substantiation: This public input corrects a problem and allows more flexibility while retaining fire safety.

Issues with the present language:
1. In fact, very few paints (interior finish materials) are noncombustible and the application of the requirements would result in most paints being "high quality epoxy", whether flammable or not.
2. There is no requirement for smoke emission in NFPA 99 and none is being proposed in this public input.
3. What is being proposed today is more severe than a material that has a flame spread or heat release of a Class A is a material which exhibits a flame spread index of no more than 25 (when tested to ASTM E 84, Steiner tunnel) or a maximum heat release rate of 800 kW and no flashover (when tested to NFPA 286, room corner test).
4. The proposed fire test criteria (from either the room corner test, NFPA 286, or the cone calorimeter, ASTM E1354), are fire performance levels intermediate between that of "flame resistant" material (as the previous edition of NFPA 99 asked for, and which was equivalent to testing to NFPA 701, a textile test) and a limited combustible material. The NFPA 286 test is already referenced in NFPA 99.

The proposed changes will provide the following:
1. Improved flexibility for use of interior finish materials over the existing NFPA 99.
2. Improved fire safety over existing hyperbaric chambers, but without the combination in the code of either excessive requirements (as represented by noncombustible materials) or no requirements (as represented by high quality epoxy).
Note further:
1. Use of the term "high quality epoxy" for the paint or finish is meaningless, as the paint or finish needs to be one that is described in performance terms and that is approved or listed for the application, to prevent any epoxy paint from being used. Any vendor of epoxy finishes will claim that they market "high quality" materials and this section is, thus, unenforceable as is. The additional words will ensure the appropriate fire safety while retaining the permission to use "high quality epoxy" finishes.
2. Since a "high quality epoxy" finish is allowed today, and no specific fire performance is required, then a material that exhibits heat release rate lower than that finish material should also be allowed.
3. NFPA 286 is a full scale room-corner test and if a material were to pass the test, it would require that it exhibits excellent fire performance, better than a typical Class A material used for interior finish (as I had proposed at the last cycle).
4. ASTM E1354 (cone calorimeter) is a small scale heat release test that provides the most comprehensive approach to assessing fire performance of materials, using a 100 mm x 100 mm (roughly 4 inches by 4 inches) test sample. If the proposed requirements are complied with, good fire performance is assured.

5. Since a limited combustible material is permitted for sound deadening materials inside the hyperbaric chamber, then they should also be permitted as finish for the chamber.
6. The changes to the terminology related to “noncombustible” and “limited combustible” from “as defined in” to “in accordance with” reflect the fact that the NFPA system is going away from “defining” these terms (with requirements) in favor of including the requirements in the body of the code or standard. That has already been approved for NFPA 101 and 5000 and other documents and I have submitted public input for the same to occur in NFPA 99.
7. The change to the word “listed” with regard to the options prevents the confusion with the specific definition in NFPA of the term “listed” for materials that have undergone listing by an outside organization.

99- Log #57 HEA-HYP **Final Action:**
(14.2.4.1.3.3)

Submitter: William Gossett, Convergent HCS
Recommendation: Revise text to read:
14.2.4.1.3.3 Breathing apparatus shall function at all pressures that can be encountered in the chamber and maintain initial source (outlet) pressure throughout all pressure changes.
Substantiation: Clarifies that the pressure supplying any breathing device needs to be maintained at the same initial pressure regardless of the chamber atmospheric pressure. For example a 50 psig outlet pressure at 1 ATA, that is operating a critical care ventilator, will still be 50 psig when the chamber is at 3 ATA.

99- Log #58 HEA-HYP **Final Action:**
(14.2.4.1.3.4)

Submitter: William Gossett, Convergent HCS
Recommendation: Revise text to read:
14.2.4.1.3.4 In the event of a fire within a chamber, provision shall be made to simultaneously switch all breathing apparatus to an air supply that is independent of the chamber atmosphere.
Substantiation: The addition of the word "simultaneously" prevents a gas system design that would require the operator to switch multiple valves during a fire deluge or any emergency requiring an air switch over.

99- Log #32 HEA-HYP Final Action:
(14.2.5)

Submitter: Alan Fuller, Health-First
Recommendation: Add new text to read as follows:
Class 'A' chambers that utilize pneumatically operated controls that are related to critical functions of safety shall be equipped with a means to function such valves/controls in the event that the primary pneumatic supply to those systems fails.
Pneumatically operated systems shall automatically be isolated from the primary source of control air in the event that pressure drops below the requirements of pneumatically operated control devices. The secondary source of pneumatic or other alternative power source shall be designed that it will automatically supply sufficient operating power without interruption to operate all affected systems at least until such time that persons within the chamber can be removed to safety.
Substantiation: A Proposal for a Back Up System Insuring That Air Actuated (Powered) Valves and Controls Have a Secondary Emergency Source of Power Available
Class 'A' hyperbaric chambers often utilize air actuated valves in their chambers' operating control system in addition to valves that are solely operated by backed up electrical means. Often these air actuated valves are of a critical nature; controlling breathing gases, rapid shut offs, fire suppression activation deluge valves, and other essential operational safety related control functions. Most are powered by the chamber's main air pressure supply that is also used to pressurize the chamber.
A loss of available pressure to these systems results in their failure to be able operate. Our chamber depends on the main air supply for powering on and off breathing gases, emergency breathing gases, rapid supply and exhaust valves, and most critically, the Fire Suppression Deluge System.
An incident occurred at our facility during the pressurization of the chamber while treating patients that resulted in almost total available air pressure loss to the operating control air. Had an emergency occurred concurrently with that event none of the aforementioned systems would function. A loss of pressure event can occur due to human error as well as an emergency situation where demand for air flow exceeds the capability of the system. (such as an air flush) Human Factors Engineering (HFE) logic calls for designs that are practical and seek to eliminate adverse outcomes that can occur when machines are being controlled by humans. In a perfect world machines would be engineered to eliminate human induced errors.
NFPA requires two independent sources of electrical supply, two types of fire suppression systems in class 'A' chambers as well as backup breathing gasses and communications. It is inconsistent to not require some similar redundant system for those affected systems that utilize air pressure as a power source for functions related to life safety.
The potential for this human induced error scenario was eliminated in our facility by adding an accumulator tank holding a reserve air pressure into the operating control air circuit. With no main air supply available this accumulator air tank is capable of functioning affected valves at least 50 cycles while still maintaining pressure exceeding the manufacturer's recommended pressures. Such a reserve is more than sufficient to terminate a treatment, operate emergency air actuated valves, while providing ample time to safely remove occupants from the chamber. I designed our system to automatically replenish the accumulator tank at times of available higher pressures and hold it in reserve, isolate the control system from the main pressure supply in the event that it drops below that of the reserve accumulator, and simultaneously switch control air demand over to the reserve and draw needed control air from the accumulator. The end result is the elimination of one more potential human induced error - one that has considerable safety ramifications yet can easily be remedied.
This technology was inspired from my previous employment where I was performing field engineering duties as a Senior Submersible Mechanical Technician. We operated manned research submersibles for science that were PVHO classed vessels rated to work at depths of 3,000 fsw while maintaining a 1ata inside the manned chamber. There were many safety related systems covering a myriad of unpleasant scenarios installed on those manned underwater vehicles, some of which were designed by myself. Our Hospital system that I installed was engineering approved by the chamber manufacturer who whole heartedly endorses the concept, design, its components and hardware specifications that were provided to them for their evaluation.
Their company will be offering this technology as an option to their customers at initial installation or as a retrofit to existing systems. The OEM feels that it would cost about $2000 dollars. I was able to do our installation for less. The manufacturer feels this is a significant technological safety step forward that is practical and affordable. It was suggested by the manufacturer that I submit this suggestion to become a requirement under NFPA, Chapter 20, Hyperbaric

Facilities.

99- Log #328b HEA-HYP Final Action:
(14.2.5.1.6 and 14.2.5.4.3)

Submitter: Keith Ferrari, Praxair, Inc.
Recommendation: Throughout the document
Emergency Electrical System should be changed to Essential Electrical Systems (EES) or Emergency Prower Supply (EPS)
whichever is applicable.
Specifically: 5.1.9.1, 5.1.9.4.1, 7.3.1.2.1.5, 7.3.1.2.3.8, 14.2.5.1.6, 14.2.5.4.3, chapter 1 and annexes.
Substantiation: The term Emergency Electrical System is used in chapters outside of chapter 6 where EES and EPS are very clearing defined (Essential Electrical Systems (EES) and Emergency Power Supply (EPS)), but not emergency electrical systems is not a defined system anywhere in the book. I believe in some chapters (outside of chapter 6) where emergency electrical system is used, the intent of the chapter was for an essentail electrical system or an emergency power supply. It is confusing when you read a chapter, outside of chapter 6, that requires an emergency electrical system, when the intent was an essential electrical system or emergency power supply.
This should be an editorial change.

99- Log #50 HEA-HYP Final Action:
(14.2.5.5.5 (New))

Submitter: James Bell, Intermountain Health Care
Recommendation: Add a new section to read:
14.2.5.5.5 The inspections, testing and maintenace of the hyperbaric fire suppression systems shall be performed by a qualified person.
Substantiation: The hyperbaric fire suppresion systems are unique and should not be inspected, tested and maintained (ITM) by a person or company that does not completely understand the system . It could be inappropriate to apply the certifications and licensing required for the ITM of other fire suppression systems to the hyperbaric chamber system. As hyperbaric chambers become more commonplace there needs to be language in our chapter regarding who can complete the hyperbaric chamber fire suppression system ITM. I find no definition of Qualified, or Qualified person in 99 chapter 3 definitions.
Suggested text is 3.3.152* Qualified person.
A person who by possession of a recognized degree, certificate, or profesional standing, or by knowledge training, and experience has successfully demonstrated the ability to perform the assigned task. (HYP) see NFPA 25 3.3.28 Qualified. A competent and capable person or company that has met the requirments and training for a given field acceptable to the AHJ.
See 5.1.14.2.2.5
14.2.5.5.5. may not be the best place for this to reside.
See also
There should be an annex note to clarify the intent as above.

99- Log #357 HEA-HYP Final Action:
(14.2.7.3.17.5(7))

Submitter: William C. Gearhart, Rep. NFPA Technical Committee 99 Chapter 14 -User
Recommendation: Revise text to read:
(7) Lithium and lithium ion batteries shall ~~be prohibited~~ be permitted in the chamber during chamber operations~~, unless the product has been accepted or listed for use in hyperbaric conditions by the manufacturer or a nationally recognized testing agency~~.
Substantiation: There are no documented incidents resulting from the failure of lithium and/or lithium ion batteries and their respective equipment in a Class A hyperbaric chamber. The previous wording casts an undue responsibility and limitation on the user of equipment necessary for use in a class A chamber treating critically ill patients requiring cardiac monitoring.
There are many pieces of equipment currently used in a class A chamber which have not been recognized by either a manufacturer or a nationally recognized testing agency.
The Technical Committee needs to provide objective testing that demonstrates the danger of using lithium or lithium ion batteries in the specific piece of eqeuipment and in the class A hyperbaric environment.

99- Log #49 HEA-HYP Final Action:
(14.3.1.4.9 (New))

Submitter: James Bell, Intermountain Health Care
Recommendation: Add a new section to read:
14.3.1.4.9 The chamber operator(s) are not allowed to use cell phones and other personal electronic devices during chamber operations for non essential purposes while operating the chamber.
Substantiation: To reduce distractions of the chamber operator during operation of the hyperbaric chamber(s).
The chamber operator needs to remain alert to the condition of the chamber(s) and occupants(s). With the advances and availability of personal electronic technologies the requirement in 14.3.1.4.8, to be physically at the control panel is not sufficient. There have been national mishaps due to inattention, “surfing the net”, talking on the cell phone, texting, watching movies, etc.
We expect the chamber operator(s) to multitask and short / intermittent usage of personal electronic devices is allowed.

99- Log #346 HEA-HYP Final Action:
(14.3.1.5.5 (New))

Submitter: W. T. Gurnée, OxyHeal Health Group
Recommendation: Add a new section to read:
Where flame resistance is specified, the fabric shall meet the requirements set forth for the small-scale test in NFPA 701, Standard Methods of Fire Tests for Flame Propagation of Textiles and Films, in an atmosphere equivalent to the maximum oxygen concentration and pressure proposed for the chamber.
Substantiation: Requirement 20.3.1.5.4.5 from the 2005 NFPA 99 edition no longer exists in the new 2012 NFPA Edition under 14.3.1.5.4 Textiles.
I request the requirement get reinstated below section 14.3.1.5.4.

99- Log #29 HEA-HYP Final Action:
(20.2.8.6.4 and 20.2.8.6.5)

NOTE: This proposal appeared as Comment 99-346 (Log #106) which was held from the A11 ROC on Proposal 99-500.

Submitter: James Bell, Intermountain Healthcare

Recommendation: Add new text to read as follows:

20.2.8.6.4 When air cylinders are used to provide breathing air in Class A or B chambers, the breathing air shall be medical air USP.

20.2.8.6.5 When cylinders are used to provide oxygen in Class A or B chambers, the gas shall be oxygen USP.

20.2.8.6.5 In addition to the required labeling on the cylinders the certificate of analysis or product certification shall be available and checked by the safety director.

Substantiation: HEA /HYP substantiation for the addition of 20.2.8.6.4 and 20.2.8.6.5 is not complete, suggest requiring the COA for the cylinders as additional verification to the labeling on the cylinders. Without the additional statement we could still connect mislabeled cylinders to our systems. Standard practice in some cases is to analyze the cylinders for O2% and tag the cylinders with initials, % and date prior to connection.

This is not original material; its reference/source is as follows:

CGA Safety- 16 - 2005 reconfirmed 2009, cga@cga.net, Blended breathing air fatalities

99- Log #228 HEA-HYP Final Action:
(A.14.2.2.5.1 (New))

Submitter: Marcelo M. Hirschler, GBH International
Recommendation: Add new section to read:
A.14.2.2.5.1 In past editions of this code “high quality epoxy” materials were allowed to be used as interior finish in these chambers, without a specific fire performance attached to them. The reason for the permission to use these materials was that they offer suitable physical properties.
Substantiation: This public input corrects a problem and allows more flexibility while retaining fire safety.

Issues with the present language:
1. In fact, very few paints (interior finish materials) are noncombustible and the application of the requirements would result in most paints being “high quality epoxy”, whether flammable or not.
2. There is no requirement for smoke emission in NFPA 99 and none is being proposed in this public input.
3. What is being proposed today is more severe than a material that has a flame spread or heat release of a Class A is a material which exhibits a flame spread index of no more than 25 (when tested to ASTM E 84, Steiner tunnel) or a maximum heat release rate of 800 kW and no flashover (when tested to NFPA 286, room corner test).
4. The proposed fire test criteria (from either the room corner test, NFPA 286, or the cone calorimeter, ASTM E1354), are fire performance levels intermediate between that of “flame resistant” material (as the previous edition of NFPA 99 asked for, and which was equivalent to testing to NFPA 701, a textile test) and a limited combustible material. The NFPA 286 test is already referenced in NFPA 99.

The proposed changes will provide the following:
1. Improved flexibility for use of interior finish materials over the existing NFPA 99.
2. Improved fire safety over existing hyperbaric chambers, but without the combination in the code of either excessive requirements (as represented by noncombustible materials) or no requirements (as represented by high quality epoxy).
Note further:
1. Use of the term “high quality epoxy” for the paint or finish is meaningless, as the paint or finish needs to be one that is described in performance terms and that is approved or listed for the application, to prevent any epoxy paint from being used. Any vendor of epoxy finishes will claim that they market “high quality” materials and this section is, thus, unenforceable as is. The additional words will ensure the appropriate fire safety while retaining the permission to use “high quality epoxy” finishes.
2. Since a “high quality epoxy” finish is allowed today, and no specific fire performance is required, then a material that exhibits heat release rate lower than that finish material should also be allowed.
3. NFPA 286 is a full scale room-corner test and if a material were to pass the test, it would require that it exhibits excellent fire performance, better than a typical Class A material used for interior finish (as I had proposed at the last cycle).
4. ASTM E1354 (cone calorimeter) is a small scale heat release test that provides the most comprehensive approach to assessing fire performance of materials, using a 100 mm x 100 mm (roughly 4 inches by 4 inches) test sample. If the proposed requirements are complied with, good fire performance is assured.
5. Since a limited combustible material is permitted for sound deadening materials inside the hyperbaric chamber, then they should also be permitted as finish for the chamber.
6. The changes to the terminology related to “noncombustible” and “limited combustible” from “as defined in” to “in accordance with” reflect the fact that the NFPA system is going away from “defining” these terms (with requirements) in favor of including the requirements in the body of the code or standard. That has already been approved for NFPA 101 and 5000 and other documents and I have submitted public input for the same to occur in NFPA 99.
7. The change to the word “listed” with regard to the options prevents the confusion with the specific definition in NFPA of the term “listed” for materials that have undergone listing by an outside organization.

99- Log #228a HEA-HYP Final Action:
(A.14.2.2.5.2)

Submitter: Marcelo M. Hirschler, GBH International
Recommendation: Revise to read:
~~A.14.2.2.5.2~~ A.14.2.2.5.3 Many commercial sound-deadening materials that might be nonflammable are porous and will absorb water from activation of the fire-suppression system and retain odor. Metallic panels that contain a large quantity of small holes or are made of wire mesh and are installed about 2.5 cm (1 in.) away from the chamber wall can be used to form an acoustic baffle. These panels should be made from corrosive-resistant materials, such as stainless steel or aluminum, and are permitted to be painted in accordance with 14.2.2.5.1.
Substantiation: This public input corrects a problem and allows more flexibility while retaining fire safety.

Issues with the present language:
1. In fact, very few paints (interior finish materials) are noncombustible and the application of the requirements would result in most paints being “high quality epoxy”, whether flammable or not.
2. There is no requirement for smoke emission in NFPA 99 and none is being proposed in this public input.
3. What is being proposed today is more severe than a material that has a flame spread or heat release of a Class A is a material which exhibits a flame spread index of no more than 25 (when tested to ASTM E 84, Steiner tunnel) or a maximum heat release rate of 800 kW and no flashover (when tested to NFPA 286, room corner test).
4. The proposed fire test criteria (from either the room corner test, NFPA 286, or the cone calorimeter, ASTM E1354), are fire performance levels intermediate between that of “flame resistant” material (as the previous edition of NFPA 99 asked for, and which was equivalent to testing to NFPA 701, a textile test) and a limited combustible material. The NFPA 286 test is already referenced in NFPA 99.

The proposed changes will provide the following:
1. Improved flexibility for use of interior finish materials over the existing NFPA 99.
2. Improved fire safety over existing hyperbaric chambers, but without the combination in the code of either excessive requirements (as represented by noncombustible materials) or no requirements (as represented by high quality epoxy).
Note further:
1. Use of the term “high quality epoxy” for the paint or finish is meaningless, as the paint or finish needs to be one that is described in performance terms and that is approved or listed for the application, to prevent any epoxy paint from being used. Any vendor of epoxy finishes will claim that they market “high quality” materials and this section is, thus, unenforceable as is. The additional words will ensure the appropriate fire safety while retaining the permission to use “high quality epoxy” finishes.
2. Since a “high quality epoxy” finish is allowed today, and no specific fire performance is required, then a material that exhibits heat release rate lower than that finish material should also be allowed.
3. NFPA 286 is a full scale room-corner test and if a material were to pass the test, it would require that it exhibits excellent fire performance, better than a typical Class A material used for interior finish (as I had proposed at the last cycle).
4. ASTM E1354 (cone calorimeter) is a small scale heat release test that provides the most comprehensive approach to assessing fire performance of materials, using a 100 mm x 100 mm (roughly 4 inches by 4 inches) test sample. If the proposed requirements are complied with, good fire performance is assured.
5. Since a limited combustible material is permitted for sound deadening materials inside the hyperbaric chamber, then they should also be permitted as finish for the chamber.
6. The changes to the terminology related to “noncombustible” and “limited combustible” from “as defined in” to “in accordance with” reflect the fact that the NFPA system is going away from “defining” these terms (with requirements) in favor of including the requirements in the body of the code or standard. That has already been approved for NFPA 101 and 5000 and other documents and I have submitted public input for the same to occur in NFPA 99.
7. The change to the word “listed” with regard to the options prevents the confusion with the specific definition in NFPA of the term “listed” for materials that have undergone listing by an outside organization.

99B- Log #6 HEA-HYP Final Action:
(2.2)

Submitter: Scott J. Harrison, Marioff Inc.
Recommendation: Add a new reference to read:
NFPA 750, Standard on Water Mist Fire Protection Systems
Substantiation: Provide a clear option to an automatic sprinkler system for protecting these rooms. Water Mist systems have been approved and installed in many sprinkler applications globally for over 15 years. They have been listed by national and internationally recognized testing laboratories such as: UL (Ordinary Hazard Group 1), FM (Light Hazard occupancies, Computer Rooms, Subfloors, Special Hazard Machinery & spaces), City of New York (Light Hazard Occupancies, Combustion Turbines, Machinery Spaces), VdS Germany (Light Hazard, Ord Haz Grp I,II parking garages & III selected occupancies, Cable Tunnels), KfV Austria (Light Hazard, Ord Haz Grp I, Combustion Turbines) and other agencies. These listings and installations have demonstrated equivalent fire protection to the authority having jurisdiction (AHJ). The addition of the proposed text will provide the AHJ a clear option to accept water mist systems as an equivalent system to an approved automatic sprinkler system thereby allowing construction alternatives without having to prove equivalency or be considered an alternative extinguishing system.

99B- Log #7 HEA-HYP Final Action:
(3.3.3.5 Oxygen-Enriched Atmosphere (OEA))

Submitter: Sherri Ferguson, Simon Fraser University
Recommendation: Revise text to read:
3.3.3.5 Oxygen-Enriched Atmosphere (OEA). For the purposes of this standard, an atmosphere in which the concentration of oxygen exceeds ~~23.5 percent by volume~~ a partial pressure of 0.235 ata.
Substantiation: This would resolve the conflict between the definition of a class E chamber being an oxygen enriched environment exceeding a partial pressure of 0,235 ata which I beleive is the intent throughout the document rater than percentage. The relative risk fire is in relation to parital pressure of oxygen not the percentage of oxygen and I beleive the intent was classification in regards to the partial pressure.

99B- Log #2 HEA-HYP Final Action:
(3.3.7 Flame Resistant (Hypobaric))

Submitter: Marcelo M. Hirschler, GBH International
Recommendation: Revise to read:
3.3.7* Flame Resistant (Hypobaric). A substance meeting the flame propagation performance criteria contained in Test Method 1 or Test Method 2, as appropriate, of NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*, for the chamber atmosphere.
Substantiation: In 1989 the NFPA Technical Committee on Fire Tests eliminated the so-called "small-scale test" from NFPA 701 because the results had been shown not to represent a fire performance that corresponded to what happened in real scale. Instead of the "small-scale test" NFPA 701 now (and for over 20 years) contains two tests (Test 1 and Test 2), which apply to materials as indicated by the text of NFPA 701 (2010) that is shown at the bottom of this public input.

However, a large number of manufacturers continue stating that the materials or products that they sell have been tested to NFPA 701, when they really mean the pre-1989 small-scale test in NFPA 701. That test no longer exists and materials or products meeting that test do not exhibit acceptable fire performance.

Text of NFPA 701 (2010):
1.1.1.1 Test Method 1 shall apply to fabrics or other materials used in curtains, draperies, or other window treatments. Vinyl-coated fabric blackout linings shall be tested according to Test Method 2.
1.1.1.2 Test Method 1 shall apply to single-layer fabrics and to multilayer curtain and drapery assemblies in which the layers are fastened together by sewing or other means. Vinyl-coated fabric blackout linings shall be tested according to Test Method 2.
1.1.1.3 Test Method 1 shall apply to specimens having an areal density less than or equal to 700 g/m^2 (21 oz/yd^2), except where Test Method 2 is required to be used by 1.1.2.

1.1.2.1 Test Method 2 (flat specimen configuration) shall be used for fabrics, including multilayered fabrics, films, and plastic blinds, with or without reinforcement or backing, with areal densities greater than 700 g/m^2 (21 oz/yd^2).
1.1.2.2 Test Method 2 shall be used for testing vinyl-coated fabric blackout linings and lined draperies using a vinyl-coated fabric blackout lining.
1.1.2.3 Test Method 2 shall be used for testing plastic films, with or without reinforcement or backing, when used for decorative or other purposes inside a building or as temporary or permanent enclosures for buildings under construction.
1.1.2.4 Test Method 2 shall apply to fabrics used in the assembly of awnings, tents, tarps, and similar architectural fabric structures and banners.

Note also the following from the text of NFPA 701 (2010):
1.2* Purpose.
1.2.1 The purpose of Test Methods 1 and 2 shall be to assess the propagation of flame beyond the area exposed to the ignition source.

A.1.1 A small-scale test method appeared in NFPA 701 until the 1989 edition. It was eliminated from the test method because it has been shown that materials that "pass" the test do not necessarily exhibit a fire performance that is acceptable. The test was not reproducible for many types of fabrics and could not predict actual full-scale performance. It should not, therefore, be used.
A.1.1.1 For the purposes of Test Method 1, the terms curtains, draperies, or other types of window treatments, where used, should include, but not be limited to, the following items:
(1) Window curtains
(2) Stage or theater curtains
(3) Vertical folding shades
(4) Roll-type window shades
(5) Hospital privacy curtains
(6) Window draperies
(7) Fabric shades or blinds

(8) Polyvinyl chloride blinds
(9) Horizontal folding shades
(10) Swags
Examples of textile items other than window treatments to which Test Method 1 applies include:
(1) Table skirts
(2) Table linens
(3) Display booth separators
(4) Textile wall hangings
(5) Decorative event tent linings not used in the assembly of a tent

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99B- Log #8 HEA-HYP Final Action:
(3.3.20 Qualified Person (New))

Submitter: James Bell, Intermountain Health Care
Recommendation: Add a new definition to read:
3.3.20* Qualified person. A person who by possession of a recognized degree, certificate, or professional standing, or by knowledge training, and experience has successfully demonstrated the ability to perform the assigned task. (HYP)
Substantiation: There is no definition for qualified person in 99-B chpt 3

99B- Log #5 HEA-HYP Final Action:
(4.1.1.3)

Submitter: Scott J. Harrison, Marioff Inc.
Recommendation: Revise to read:
4.1.1.3 The room or rooms housing the hypobaric chambers and service equipment, such as those described in 4.1.1, shall have an automatic sprinkler system installed in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems or an automatic water mist fire protection system installed in accordance with NFPA 750, *Standard on Water Mist Fire Protection Systems*.
Substantiation: Provide a clear option to an automatic sprinkler system for protecting these rooms. Water Mist systems have been approved and installed in many sprinkler applications globally for over 15 years. They have been listed by national and internationally recognized testing laboratories such as: UL (Ordinary Hazard Group 1), FM (Light Hazard occupancies, Computer Rooms, Subfloors, Special Hazard Machinery & spaces), City of New York (Light Hazard Occupancies, Combustion Turbines, Machinery Spaces), VdS Germany (Light Hazard, Ord Haz Grp I,II parking garages & III selected occupancies, Cable Tunnels), KfV Austria (Light Hazard, Ord Haz Grp I, Combustion Turbines) and other agencies. These listings and installations have demonstrated equivalent fire protection to the authority having jurisdiction (AHJ). The addition of the proposed text will provide the AHJ a clear option to accept water mist systems as an equivalent system to an approved automatic sprinkler system thereby allowing construction alternatives without having to prove equivalency or be considered an alternative extinguishing system.

99B- Log #9 HEA-HYP Final Action:
(4.5.4.3 (New))

Submitter: James Bell, Intermountain Health Care
Recommendation: Add a new section to read:
4.5.4.3 The inspections, testing and maintenance of the hypobaric fire suppression system shall be performed by a qualified person.
Substantiation: There is no definition in 99-B for who can do the testing and maintenance of hypobaric chamber fire suppression systems. It could be inappropriate to apply standards and codes from buildings and other fire suppression systems to the hypobaric chamber.
The proposed definition in Chapter 3 is Qualified Person. A person who by possession of a recognized degree, certificate, or professional standing, or by knowledge training, and experience has successfully demonstrated the ability to perform the assigned task. (HYP)

99B- Log #10 HEA-HYP Final Action:
(5.1.4.4.3 and 5.1.4.4.3.1 (New))

Submitter: James Bell, Intermountain Health Care
Recommendation: Add new sections to read:
5.1.4.4.3 During chamber operations with an occupant(s) in the chamber, the operator shall be physically present and shall maintain visual or audible contact with the control panel or the chamber occupants.
5.1.4.4.3.1 The chamber operator(s) are not allowed to use cell phones and other personal electronic devices during chamber operations for non essential purposes.
Substantiation: There is no language as in NFPA 99 14.3.1.4.8 for a chamber operator to be present at the panel, we should consider stating the obvious in 99-B.
To reduce distractions of the chamber operator during operation of the hypobaric chamber(s). The chamber operator needs to remain alert to the condition of the chamber(s) and occupants(s). With the advances and availability of personal electronic technologies the requirement to be physically at the control panel is not sufficient. There have been national mishaps during hyperbaric , driving, operating boats and flying due to inattention, “surfing the net”, talking on the cell phone, texting, watching movies, etc.
We expect the chamber operator(s) to multitask and short / intermittent usage of personal electronic devices is allowed.

99B- Log #11 HEA-HYP Final Action:
(5.1.7.2)

Submitter: Amy Tan, Placentia, CA
Recommendation: Revise text to read:
5.1.7.2 Garments fabricated of 100 percent cotton or a blend of ~~not more than~~ 50/50 cotton and polyester antistatic fabric shall be permitted in Class E chambers equipped with fire protection as specified in Section 4.5.
Substantiation: It is unclear whether "a blend of not more than 50/50 cotton and polyester fabric" means more cotton or polyester is acceptable - since "not more than 50/50" would mean a lower ratio such as 40/60 or 10/90 is permitted. Also, the wording makes it unclear whether or not any deviation of 50/50 blend is permitted (i.e. 60/40 cotton/polyester or 40/60 cotton/polyester) or only 50/50 is permitted.
Additionally, the insertion of "antistatic" is important to specify, as not all blends are equivalent and the most important component is being antistatic.

99B- Log #3 HEA-HYP Final Action:
(5.1.7.5)

Submitter: Marcelo M. Hirschler, GBH International
Recommendation: Revise to read:
5.1.7.5 Fabric used in Class E chambers shall meet the flame propagation requirements contained in Test Method 1 or Test Method 2, as appropriate, of NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*, except that the test atmosphere shall be 100 percent oxygen at normal atmospheric pressure.
Substantiation: In 1989 the NFPA Technical Committee on Fire Tests eliminated the so-called "small-scale test" from NFPA 701 because the results had been shown not to represent a fire performance that corresponded to what happened in real scale. Instead of the "small-scale test" NFPA 701 now (and for over 20 years) contains two tests (Test 1 and Test 2), which apply to materials as indicated by the text of NFPA 701 (2010) that is shown at the bottom of this public input.

However, a large number of manufacturers continue stating that the materials or products that they sell have been tested to NFPA 701, when they really mean the pre-1989 small-scale test in NFPA 701. That test no longer exists and materials or products meeting that test do not exhibit acceptable fire performance.

Text of NFPA 701 (2010):
1.1.1.1 Test Method 1 shall apply to fabrics or other materials used in curtains, draperies, or other window treatments. Vinyl-coated fabric blackout linings shall be tested according to Test Method 2.
1.1.1.2 Test Method 1 shall apply to single-layer fabrics and to multilayer curtain and drapery assemblies in which the layers are fastened together by sewing or other means. Vinyl-coated fabric blackout linings shall be tested according to Test Method 2.
1.1.1.3 Test Method 1 shall apply to specimens having an areal density less than or equal to 700 g/m^2 (21 oz/yd^2), except where Test Method 2 is required to be used by 1.1.2.

1.1.2.1 Test Method 2 (flat specimen configuration) shall be used for fabrics, including multilayered fabrics, films, and plastic blinds, with or without reinforcement or backing, with areal densities greater than 700 g/m^2 (21 oz/yd^2).
1.1.2.2 Test Method 2 shall be used for testing vinyl-coated fabric blackout linings and lined draperies using a vinyl-coated fabric blackout lining.
1.1.2.3 Test Method 2 shall be used for testing plastic films, with or without reinforcement or backing, when used for decorative or other purposes inside a building or as temporary or permanent enclosures for buildings under construction.
1.1.2.4 Test Method 2 shall apply to fabrics used in the assembly of awnings, tents, tarps, and similar architectural fabric structures and banners.

Note also the following from the text of NFPA 701 (2010):
1.2* Purpose.
1.2.1 The purpose of Test Methods 1 and 2 shall be to assess the propagation of flame beyond the area exposed to the ignition source.

A.1.1 A small-scale test method appeared in NFPA 701 until the 1989 edition. It was eliminated from the test method because it has been shown that materials that "pass" the test do not necessarily exhibit a fire performance that is acceptable. The test was not reproducible for many types of fabrics and could not predict actual full-scale performance. It should not, therefore, be used.
A.1.1.1 For the purposes of Test Method 1, the terms curtains, draperies, or other types of window treatments, where used, should include, but not be limited to, the following items:
(1) Window curtains
(2) Stage or theater curtains
(3) Vertical folding shades
(4) Roll-type window shades
(5) Hospital privacy curtains
(6) Window draperies
(7) Fabric shades or blinds

(8) Polyvinyl chloride blinds
(9) Horizontal folding shades
(10) Swags

Examples of textile items other than window treatments to which Test Method 1 applies include:

(1) Table skirts
(2) Table linens
(3) Display booth separators
(4) Textile wall hangings
(5) Decorative event tent linings not used in the assembly of a tent

99B- Log #4 HEA-HYP Final Action:
(A.3.3.7)

Submitter: Marcelo M. Hirschler, GBH International
Recommendation: Revise to read:

A.3.3.7 Flame Resistant (Hypobaric). The material should be tested using the appropriate test (i.e. Test 1 or Test 2, primarily as a function of the specimen areal weight) contained within NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*, and should meet the corresponding flame propagation performance criteria, except that the test should be conducted in the gaseous composition and maximum pressure at which the chamber will be operated. A source of ignition other than the gas burner specified in NFPA 701 might be required for this test if it is to be performed in 100 percent oxygen at normal atmospheric pressure. Certain materials might off-gas during exposure to a hypobaric environment and/or give off toxic cyanide fumes in the event of ignition. Special care should be taken to avoid using such materials wherever possible.

Substantiation: In 1989 the NFPA Technical Committee on Fire Tests eliminated the so-called "small-scale test" from NFPA 701 because the results had been shown not to represent a fire performance that corresponded to what happened in real scale. Instead of the "small-scale test" NFPA 701 now (and for over 20 years) contains two tests (Test 1 and Test 2), which apply to materials as indicated by the text of NFPA 701 (2010) that is shown at the bottom of this public input.

However, a large number of manufacturers continue stating that the materials or products that they sell have been tested to NFPA 701, when they really mean the pre-1989 small-scale test in NFPA 701. That test no longer exists and materials or products meeting that test do not exhibit acceptable fire performance.

Text of NFPA 701 (2010):
1.1.1.1 Test Method 1 shall apply to fabrics or other materials used in curtains, draperies, or other window treatments. Vinyl-coated fabric blackout linings shall be tested according to Test Method 2.
1.1.1.2 Test Method 1 shall apply to single-layer fabrics and to multilayer curtain and drapery assemblies in which the layers are fastened together by sewing or other means. Vinyl-coated fabric blackout linings shall be tested according to Test Method 2.
1.1.1.3 Test Method 1 shall apply to specimens having an areal density less than or equal to 700 g/m^2 (21 oz/yd^2), except where Test Method 2 is required to be used by 1.1.2.

1.1.2.1 Test Method 2 (flat specimen configuration) shall be used for fabrics, including multilayered fabrics, films, and plastic blinds, with or without reinforcement or backing, with areal densities greater than 700 g/m^2 (21 oz/yd^2).
1.1.2.2 Test Method 2 shall be used for testing vinyl-coated fabric blackout linings and lined draperies using a vinyl-coated fabric blackout lining.
1.1.2.3 Test Method 2 shall be used for testing plastic films, with or without reinforcement or backing, when used for decorative or other purposes inside a building or as temporary or permanent enclosures for buildings under construction.
1.1.2.4 Test Method 2 shall apply to fabrics used in the assembly of awnings, tents, tarps, and similar architectural fabric structures and banners.

Note also the following from the text of NFPA 701 (2010):
1.2* Purpose.
1.2.1 The purpose of Test Methods 1 and 2 shall be to assess the propagation of flame beyond the area exposed to the ignition source.

A.1.1 A small-scale test method appeared in NFPA 701 until the 1989 edition. It was eliminated from the test method because it has been shown that materials that "pass" the test do not necessarily exhibit a fire performance that is acceptable. The test was not reproducible for many types of fabrics and could not predict actual full-scale performance. It should not, therefore, be used.
A.1.1.1 For the purposes of Test Method 1, the terms curtains, draperies, or other types of window treatments, where used, should include, but not be limited to, the following items:
(1) Window curtains

(2) Stage or theater curtains
(3) Vertical folding shades
(4) Roll-type window shades
(5) Hospital privacy curtains
(6) Window draperies
(7) Fabric shades or blinds
(8) Polyvinyl chloride blinds
(9) Horizontal folding shades
(10) Swags

Examples of textile items other than window treatments to which Test Method 1 applies include:

(1) Table skirts
(2) Table linens
(3) Display booth separators
(4) Textile wall hangings
(5) Decorative event tent linings not used in the assembly of a tent