MEETING OF THE
TECHNICAL COMMITTEE ON
RESPIRATORY PROTECTION EQUIPMENT

25-27 JANUARY 2011

Orlando, FL

AGENDA

Tuesday, 25 January 2011 (continuing **NLT** 17:00 on 27 January 2011)

08:30, Chairman's Remarks, introduction of members and guests and direction to TGs

09:00-13:00 TG meeting on SCBA Mask Lens

13:00-17:00 TG meeting on Communications

Wednesday, 26 January 2011

09:00-13:00 TG meeting on Buddy Breathers

1. **13:00** Call to order, Chairman Rossos
2. Introduction of New Members / Members and Guests
3. Committee Procedures, Staff Liaison
4. Approval of the Minutes of the October, meeting in San Diego, CA
5. Chairman's Remarks, Chairman Rossos
6. Flatpack update, Chairman Rossos
7. Administrative updates Re: 1981 FI & 1984 TIA and the division of 1981
8. Overview of new 1981 format and TGs, Chairman Rossos
9. Overview of 1989 and 1852, Chairman Rossos
10. Update of new High Flow PAPR assignment, Staff Liaison
11. Task Group Reports
    - TG on Mask Lens
    - TG on Communications
    - TG on Buddy Breathers
12. Old Business
13. New Business
14. Adjourn **NLT** 17:00 on 27 January 2011

1852- Log #1 FAE-RPE Final Action:
(5.3)

Submitter: Suleiman Said Al Adawi, Petroleum Development Oman

Recommendation: The standard should specify the spare self contained breathing apparatus cylinders proportionate to the number of breathing apparatus sets based on decided numbers of BA sets in fire stations. For instance 1 BA set should have 1 spare cylinder.

NOTE: I tried to read different standards and seek/exchange ideas with my colleagues but never come across to the standard specifying the number of spare cylinders against BA sets.

Substantiation: The proposal will assist when new introduced fire station (zero base fire station i.e. if the fire station decided to have 10 BA sets (including appliances and back up sets in general) then the required of additional 10 spare BA cylinders might be essential. Thus will cover for BA wearer to use 2 cylinders plus contingencies such as lost of air incase face mask visor broken any other technical faults that cause lost of air, vast emergencies, volunteers, outage of cylinders for hydrostatic pressure test etc.

1981- Log #1 FAE-RPE Final Action:
(Entire Document)

Note: This Proposal appeared as Comment 1981-33 (Log #5) which was held from the F2006 ROC on Proposal 1981-1.
Submitter: Tom Kissner, Smithsburg, MD
Recommendation: Instead of changing the cylinders, why don't you just change the bracket that holds the cylinder? Make all of the manufactures can to a ratchet type assembly. Have NIOSH and OSHA lift there cylinder requirement by the same manufacture to gain there certification for use.
Substantiation: Agree, but with changes.

1981- Log #2 FAE-RPE Final Action:
(Entire Document)

Note: This Proposal appeared as Comment 1981-5 (Log #14) which was held from the F2006 ROC on Proposal 1981-2.
Submitter: David Covington, San Antonio Fire Department
Recommendation: It is my understanding that the committee is working on cylinder interoperability compatibility. Although this may be a good idea, I caution the committee to consider it very carefully in light of recent events in San Antonio. We recently experienced a number of o-ring failures where the SCBA valve screws in to the cylinder. After sending units to NIOSH and Southwest Research Institute (a respected research lab in San Antonio), we have found that the type of fitting that we now use in our SCBA cylinders is antiquated and based on a 1965 CGA standard.
Substantiation: The engineers at SWRI have concluded that the design is flawed and this would explain our o-ring failures. Our informal poll of departments confirmed that virtually all SCBA manufacturers have o-ring issues. The CGA spec does not include an o-ring but allows it when hand tightening. We have more information if you wish to see it, but the real issue is that it would be wrong to build an interoperability based on a defective design that has plagued the fire service for many years. The correct method would be to consult the dive people who have ditched the design and work out a new fitting that works for firefighters.

1981- Log #3 FAE-RPE Final Action:
(Entire Document)

Note: This Proposal appeared as Comment 1981-10 (Log #88) which was held from the F2006 ROC on Proposal 1981-2.
Submitter: I. David Daniels, International Association of Fire Chiefs
Recommendation: The Safety, Health and Survival section of the IAFC is in favor of changes to SCBAs that provide for interoperability. To this end, we believe that the most effective approach would be to require the retroactive installation of a standardized RIC/RIT connection, in addition to requiring that all new assemblies be provided with the connection. We agree that work needs to be done on cylinder standardization, but do not feel it reasonable to expect that this would occur in a reasonable period of time, given the technical financial and legislative changes that will be necessary to accomplish this.
Substantiation: The problem with cylinder standardization in the standard is the reality that many agencies will not be able to comply with the requirement in the short term principally for financial reasons. Fire Departments continue to struggle with shrinking budgets; therefore, it does not seem like a good idea to create a requirement that few will strive to achieve due to perceptions barriers, when the same objective can be achieved by alternative means. Further, a requirement in the standard for standardization of cylinders may create a greater safety hazard in its place if organizations elect to ignore it.

1981- Log #4 FAE-RPE Final Action:
(Entire Document)

Note: This Proposal appeared as Comment 1981-26 (Log #245) which was held from the F2006 ROC on Proposal 1981-2.

Submitter: Roger Donnellan, Waynesville, NC

Recommendation: Every new SCBA purchased has a RIT fitting at the cylinder valve. This RIT fitting is universal on all new SCBA no matter the manufacturer. The new NFPA update on SCBA proposed enhanced communications and CBRN, both of these proposed upgrades are long overdue. You should also include a self rescue on SCBA's harness, when all other avenues are closed.

I suggest removal of all 2,200 psi and 3,000 psi SCBA's cylinders and upgrade to 4,500 psi 1,200, 1800 and 2400 liters. All cylinder valve outlets should be on the same side.

Substantiation: I disagree that there will be no more innovations on SCBA's.

1981- Log #5 FAE-RPE Final Action:
(Entire Document)

Note: This Proposal appeared as Comment 1981-31 (Log #31) which was held from the F2006 ROC on Proposal 1981-2.

Submitter: Tom May, Rochester, NY

Recommendation: I would like to comment on the SCBA Standard 1981.

The heads up display is a good idea to remind wearers of their air supply, but I have found problems. In very dark conditions the bright lights opposes one's night vision. While searching for both life and fire I find the heads up display very distracting, and I feel more blind than usual.

My suggestion is to try using all red lights to allow better night vision, or just one red light that comes on at 1/2 the bottles capacity.

Substantiation: The current heads up display could cause as many problems as it solves. I can imagine that some one could miss the signs of rollover, or miss finding a fire when the glow of a fire is not seen due to that blinding green light in one's face.

I have heard the same comments from other firefighters, but no one seems to know how to make changes. I assume this is a start. I have also heard that NFPA codes are mainly developed by industry and those who do not use the firefighting equipment. I hope that the firefighters who use the equipment are listened to.

1981- Log #6 FAE-RPE Final Action:
(6.7 (New))

Submitter: J. Roger Lackore, Pierce Manufacturing, Inc.
Recommendation: Add new text as follows:

6.7 Provisions for SCBA Retention in on an Apparatus

6.7.1 Each SCBA shall maintain an area clear of all obstructions forming a cylindrical area concentric with the bottle and one inch greater in radius than the bottle radius. For a cylinder with a dome shaped top this clear area shall begin 1 inch below the point where the spherical top of the bottle transitions into the cylindrical body of the bottle. For cylinders with flat tops, this clear area shall begin 2 inches below the top of the cylinder. This clear cylindrical area shall extend to 4 inches above the top of the bottle (see fig 1).

6.7.2 Each SCBA shall maintain a clear annular area concentric with the bottle, one inch greater in radius than the bottle radius, and 2 inches in height beginning at the back of the SCBA bottle and sweeping 160 degrees both clockwise and counterclockwise around the bottle. This clear annular area shall be located vertically on the bottle beginning on the plane at which the spherical top of the bottle transitions into the cylindrical body of the bottle, and extending downward (see fig 2). This area may overlap with the clear area specified in paragraph 6.7.1.

6.7.3 The bottle valve (or other lowest component) of each SCBA shall include a vertical surface with an area on the side of the bottle where the pack is mounted that is clear of obstructions for 1.5 inches up from the bottom of the component and for 0.5 inches from the valve (see fig 3).

6.7.4 Each SCBA pack shall be attached to the cylinder and constructed in such a manner that the SCBA can be extracted from a retention device that grips the cylinder with a maximum force of 80 lbs without damaging the pack for the expected life of the SCBA.

6.7.5 The SCBA bottle valve shall remain attached to the bottle without damage when a force of 20 times the weight of the bottle and pack is exerted at the CG of the SCBA for 10 seconds with the SCBA being held in two places, at the top of the bottle and at the extreme end of the valve.

Substantiation: SCBAs are commonly located inside the occupant area of fire or emergency vehicle apparatus. NFPA 1901 requires that such SCBAs be retained in a bracket to a minimum of 9 gs of deceleration to protect the occupants from the SCBA becoming a projectile in the event of a crash. SCBA retention bracket manufacturers struggle to design devices to adequately grip the bottle. The wide variety of SCBA pack designs, and the constant redesign of these products, makes it very difficult to ensure that a retention bracket will work with any SCBA manufactures product. This restricts inner-operability and places an undue burden on the fire service. This proposal establishes standards that would provide clear areas on each SCBA cylinder around which the SCBA retention device manufacturer can design universal products. It also establishes a minimum standard for SCBA pack durability when subjected to the repeated act of extracting the SCBA from a retention device that grips the cylinder to retain it in a device.

The 80 lb extraction force criteria is based on actual measurements of various SCBA holders on the market. As a base-line, the old “broom-clip” style bottle holders require 35 lb extraction force. This value also seems reasonable since the weight of the bottle and pack can weigh as much as 35 lbs, and the pack should survive continually pulling of at least twice its own weight so that it can last through the riggers of use at the fire scene.

The SCBA is commonly secured into the holder by gripping the bottle at the top, and the valve at the bottom. Although testing indicates that the typical bottle valve is more than strong enough to withstand the retention forces using this method of gripping, there does not appear to be any minimum valve strength criteria in the standard that would assure that future valves would always be strong enough to be treated in this manner without damage. The factor of 20 is well over the 9 g factor in 1901, but rather matches the FMVSS 207 seating systems. The logic being that if the seat should be held to the vehicle at 20 g, then the pack should be retained in the seat to 20 g.

1981- Log #7 FAE-RPE Final Action:
(6.7 (New))

Submitter: Roger Lackore, Pierce Mfg.
Recommendation: Add new text to read as follows:

6.7 Provisions for SCBA Retention in Fire Apparatus

6.7.1 Each SCBA shall maintain a space at the top of the bottle that is clear of all obstructions for retention devices that grab the top of the bottle. This space shall be bounded by a cylindrical volume concentric with the bottle and one inch greater in radius than the bottle radius. For a cylinder with a dome shaped top this clear area shall begin 1 inch below the point where the spherical top of the bottle transitions into the cylindrical body of the bottle (see fig. 1A). For a cylinder with a flat top, this clear volume shall begin 2 inches below the top of the cylinder (see fig. 1B). Each clear volume shall be preserved for at least 4 inches above the top of the bottle.

6.7.2 Each SCBA shall maintain a space near the top of the bottle that is clear of all obstructions for retention devices that grab around the body of the bottle. This space shall be bounded by an annular volume concentric with the bottle, 1.0 inch greater in radius than the bottle radius, and 2.0 inches in height beginning at the back of the SCBA bottle and sweeping 160 degrees both clockwise and counterclockwise around the bottle. For a cylinder with a dome shaped top this clear volume shall begin 1 inch below the point where the spherical top of the bottle transitions into the cylinderical body of the bottle (see fig. 2A). For a cylinder with a flat top, this clear volume shall begin 2 inches below the top of the cylinder (see fig. 2B). This volume may overlap with the volume specified in paragraph 6.7.1.

6.7.3 The bottle valve (or other lowest component) of each SCBA shall include a vertical surface with a volume on the side of the bottle where the pack is mounted that is clear of obstructions to accommodate a retention tab. This space shall be bounded by a rectangular prism that is 1.5 inches high beginning at the bottom of the valve, 0.5 inches deep from the face of the valve, and 3 inches in width centered on the valve (see fig 3).

6.7.4 Each SCBA pack shall be attached to the cylinder and constructed in such a manner that the SCBA can be extracted from a retention device with a force of 80 lbs without damaging the pack straps or frame for the expected life of the SCBA.

6.7.5 The SCBA bottle valve shall remain attached to the bottle without damage when a force of 20 times the weight of the bottle and pack is exerted at the CG of the SCBA for 10 seconds with the SCBA being retained by a fixture that grips the top of the bottle and the extreme end of the valve (see figure 4).

****Insert Artwork Here (6 pieces: Figures 1A, 1B, 2A, 2B, 3, 4)****

Substantiation: SCBAs are commonly located inside the occupant area of fire or emergency vehicle apparatus. NFPA 1901 requires that such SCBAs be retained in a bracket to a minimum of 9 gs of deceleration to protect the occupants from the SCBA becoming a projectile in the event of a crash. SCBA retention bracket manufacturers struggle to design devices to adequately grip the bottle. The wide variety of SCBA pack designs, and the constant redesign of these products, makes it very difficult to ensure that a retention bracket will work with all SCBA packs, frames and bottles. This restricts inner-operability and places an undue burden on the fire service. This proposal establishes standards that would provide clear spaces on each SCBA cylinder around which the SCBA retention device manufacturer can design universal products. It also establishes a minimum standard for SCBA pack durability when subjected to the repeated act of extracting the SCBA from a retention device that grips the cylinder to retain it in the holder.

The 80 lb extraction force criteria is based on actual measurements of various SCBA holders on the market. As a base-line, the old “broom-clip” style bottle holders require 35 lb extraction force. This value also seems reasonable since the weight of the bottle and pack can weigh as much as 35 lbs, and the pack should survive continually pulling of at least twice its own weight so that it can last through the riggers of use at the fire scene.

The SCBA is commonly secured into the holder by gripping the bottle at the top, and the valve at the bottom. Although testing indicates that the typical bottle valve is more than strong enough to withstand the retention forces using this method of gripping, there does not appear to be any minimum valve strength criteria in the standard. Acceptance of this proposal will assure that future valves would always be strong enough to be treated in this manner without damage. The 20 g factor matches the value used in FMVSS 207 for retention of seating systems. The logic for this value is that if the

seat should be held to the vehicle at 20 g, then the pack should be retained in the seat to 20 g.

1981- Log #8 FAE-RPE Final Action:
(1.6)

Submitter: Suleiman Said Al Adawi, Petroleum Development Oman
Recommendation: The standard should specify the spare self contained breathing apparatus cylinders proportionate to the number of breathing apparatus sets based on decided numbers of BA sets in fire stations. For instance 1 BA set should have 1 spare cylinder.
NOTE: I tried to read different standards and seek/exchange ideas with my colleagues but never come across to the standard specifying the number of spare cylinders against BA sets.
Substantiation: The proposal will assist when new introduced fire station (zero base fire station i.e. if the fire station decided to have 10 BA sets (including appliances and back up sets in general) then the required of additional 10 spare BA cylinders might be essential. Thus will cover for BA wearer to use 2 cylinders plus contingencies such as lost of air incase face mask visor broken any other technical faults that cause lost of air, vast emergencies, volunteers, outage of cylinders for hydrostatic pressure test etc.

1981- Log #9 FAE-RPE Final Action:
(2.3.6)

Submitter: Bob Eugene, Underwriters Laboratories Inc.
Recommendation: Revise text to read as follows:
2.3.6 UL Publications.
Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.
ANSI/UL 913, Standard for Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1 Hazardous (Classified) Locations, ~~Sixth edition, July 31,~~ 2006, Revised 2008.
Substantiation: Update referenced standard to most recent revision.

1981- Log #10 FAE-RPE Final Action:
(Entire Document)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Recommendation: Develop criteria for alternative pressure vessel technology incorporated into SCBA.
Substantiation: Consideration should be provided in the revision of NFPA 1981 to alternative pressure vessels. One such pressure vessel technology based on an array of multiple non-metal lined pressures should be used as a model for the development of new criteria that anticipate alternative pressure vessel implications for design and performance criteria provided in NFPA 1981. A project team lead by the IAFF will be willing to propose specific criteria for the committee's consideration.

1981- Log #11 FAE-RPE Final Action:
(6.1.3)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Recommendation: Delete text as follows:
~~6.1.3 SCBA that are certified as compliant with NFPA 1981 shall also be certified by NIOSH as compliant with the Statement of Standard for NIOSH CBRN SCBA Testing.~~
Bring these requirements into the standard as new criteria and test methods.
Substantiation: The current arrangement for the testing of SCBA by NIOSH for CBRN is awkward. Per OMB Circular A119, the current criteria for CBRN testing for SCBA should become part of NFPA 1981. This would facilitate updating requirements, considering the use of surrogate agents, and other efficiencies that would lessen the costs of testing and allow for more frequent, consensus based reviews of the standard.

1981- Log #12 FAE-RPE Final Action:
(6.1.2)

Submitter: Jeffrey O. Stull, International Personnel Protection, Inc.
Recommendation: Revise text to read as follows:
6.1.2 Prior to certification of SCBA to the requirements of this standard, SCBA shall be NIOSH certified in accordance with 42 CFR 84, with the following modifications:
(1) Each remaining service-life indicator or warning device shall give an alarm when the remaining service life of the apparatus is reduced within a range as specified by the authority having jurisdiction but not less than 20 to 25 percent of its rated service time.
Substantiation: The requirement that SCBA be certified to the requirements of 42 CFR Part 84 is understood as OSHA regulations in 29 CFR Part 1910.132 dictated the NIOSH-approved respirators. However, in this case, the Federal regulations handicap the emergency service with requirements that were principally developed for industrial situations. The entire embodiment of NFPA 1981 is a testament to the additional requirements that must be specified for safe and effective use of SCBA for emergency services that are not included in the Federal regulations.

1981- Log #13 FAE-RPE Final Action:
(4.2.8.2)

Submitter: William Antunes, Structural Composites Industries
Recommendation: Revise text to read as follows:
Replacements parts, components, and add-on accessories for SCBA's certified to the 1997 edition or the 2002 edition of NFPA 1981 shall be approved by NIOSH in accordance with 42 CFR 84, "Respiratory Protective Devices, Tests for Permissibility." Cylinders that meet or exceed NIOSH's Technical Specifications under 42 CFR 84 are permissible for use by end users provided they are authorized by the Department of Transportation (DOT) approval process. Cylinders must be marked with the required DOT labeling. Manufacturer of these cylinders must maintain as ISO 9001 or AS9100 certification for quality assurance. Cylinders meeting this criteria that are of the same form, fit and function as those originally certified by NIOSH are permissible for use by end users and do not require certification by NIOSH.
Substantiation: 1) The current standard results in an economic hardship of end users by;
a) Unnecessarily increasing the cost of replacement cylinders without providing any additional value-added benefit
b) Requires purchase of new cylinders, prior to end of useful life, by end users when procuring different brands of SCBA
2) Current standard does not allow for cylinder innovation as the NIOSH approval is granted to Respirator Manufacturers who do not manufacture cylinders.
3) NIOSH's Standard Application Procedure (SAP) does not provide cylinder specific testing and approval certification. NIOSH's only technical requirement is DOT approval.
4) Cylinder durability is limited as end users are limited to few choices by NIOSH approval holders.
5) Interchangeability of cylinders is made difficult
a) Creates a proprietary system which restricts the ability of user to interchange cylinders
b) Closed and proprietary systems do nothing to mitigate safety concerns.

1981- Log #14 FAE-RPE Final Action:
(6.1.2.2)

Submitter: Richard M. Duffy, International Association of Fire Fighters
Recommendation: Revise text to read as follows:
6.1.2.2 SCBA shall have a NIOSH-certified rated service time of at least ~~30~~ 45 minutes.
Substantiation: The fire service experiences a number of injuries and fatalities each year because fire fighters run out of air. The 30 minutes of air because the service life rating is based on 40 liters per minute service life. New cylinder technology is available and will be available that the weight differences for increased service life cylinders will be minimal.

1981- Log #CP1 FAE-RPE Final Action:
(Entire Document)

Submitter: Technical Committee on Respiratory Protection Equipment,
Recommendation: Review entire document to: 1) Update any extracted material by preparing separate proposals to do so, and 2) review and update references to other organizations documents, by preparing proposal(s) as required.
Substantiation: To conform to the NFPA Regulations Governing Committee Projects.

1981- Log #15 FAE-RPE Final Action:
(2.3.6)

Submitter: John F. Bender, Underwriters Laboratories Inc.
Recommendation: Revise text to read as follows:

2.3.6 UL Publications. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

ANSI/UL 913, Standard for Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division I Hazardous (Classified) Locations, 2006, Revised ~~2008~~ 2010.

Substantiation: Reason: Update referenced standards to most recent revisions.

1989- Log #1 FAE-RPE Final Action:
(5.1.3)

Submitter: J. Michael Carlson, TRI Air Testing
Recommendation: Revise text to read as follows:
5.1.3 The accredited testing laboratory shall test the samples for breathing air quality levels as specified in Section ~~5.3~~ 5.6.
Substantiation: Problem: Wrong paragraph referenced.
Substantiation: Air quality is discussed in section 5.6. Section 5.3 is about synthetic air.

1989- Log #2 FAE-RPE Final Action:
(5.2.2)

Submitter: J. Michael Carlson, TRI Air Testing
Recommendation: Revise text to read as follows:
5.2.2 The accredited testing laboratory shall test the samples for breathing air qualily levels as specified in Section ~~5.3~~ 5.6.
Substantiation: Problem: Wrong paragraph referenced.
Substantiation: Air quality is discussed in section 5.6. Section 5.3 is about synthetic air.

1989- Log #3 FAE-RPE Final Action:
(5.4.2.2)

Submitter: J. Michael Carlson, TRI Air Testing
Recommendation: Add new text to read as follows:
5.4.2.2 All air storage cylinders and receivers must be purged of any stored contaminated air, filled with air from a compressor system with air meeting this standard and tested to the requirements of Section 5.6 prior to being placed back into service.
Substantiation: Problem: Currently there is no mention in any sections of this document specifically requiring the purge, fill and testing of storage cylinders and receivers that have contaminated air.
Substantiation: Adding above text sets a minimum level of storage system maintenance and testing.

1989- Log #4 FAE-RPE Final Action:
(5.5.1 and A.5.5.1)

Submitter: J. Michael Carlson, TRI Air Testing
Recommendation: Revise text to read as follows:

5.5.1 ~~Quarterly~~ Breathing air samples required for Section 5.1 Regular Periodic Testing shall be obtained ~~directly at the point of air transfer from the breathing air system. The point of air transfer shall be any connection where breathing air cylinders or receivers are routinely filled.~~ downstream from purification components and prior to or bypassing any storage cylinders or receivers.

A.5.5.1 ~~The purpose of the air samples take before and after changing the filter is to verify that the compressor is producing compressed breathing that meets this standard. The purpose is not to test the quality of air stored in cascade cylinders or receivers, or to test the air at the point of transfer to SCBAs. Therefore, these samples need to be obtained from a point downstream of the air purification system (but as close to it as possible), and upstream of any air cascade storage cylinders or receivers.~~ The purpose of the air samples taken during periodic quarterly testing is to ensure the compressor is producing compressed breathing air that meets this standard. The cascade systems or receivers that are being filled by the compressor system being tested do not need to be tested during every quarterly periodic testing cycle as long as there are required documented tests showing that the air in the cascade system meets this standard at some point and the compressor system filling the cascade or receivers has continuously met the standards required by sections 5.1 and 5.2. ~~The quarterly samples test the compressed breathing air that is transferred to the SCBA. Therefore, these samples need to be obtained at the point of transfer to the SCBA breathing air cylinders downstream of the cascade storage cylinders or receivers.~~

A.5.5.2 The purpose of the air samples taken before and after changing the filter is to verify that the compressor is producing compressed breathing that meets this standard. The purpose is not to test the quality of air stored in cascade cylinders or receivers, or to test the air at the point of transfer to SCBAs. Therefore, these samples need to be obtained from a point downstream of the air purification system (but as close to it as possible), and upstream of any air cascade storage cylinders or receivers. Any time a compressor system fails to meet this standard all cascade systems and receivers supplied by the compressor must be purged, refilled with air from the compressor that has passed this specification and tested to the requirements of this standard before being placed back into service.

Substantiation: Problem: As currently written paragraph 5.5.1 periodic quarterly testing may not find all compressors that fail this standard since air is tested at air transfer points not necessarily as produced by the compressor. The air being produced by a failed compressor would mix with residual air in the cascade or receiver and therefore could pass this standard. Also, some components such as oil mist and particulate matter could be captured within the cascade system. Eventually the contamination could become such a load that it makes it out of the air transfer point, but by then the whole system is contaminated.

Substantiation: Performing the air sampling on the compressor system prior to where the air enters a cascade or receiver would find problems at an earlier stage and therefore bring an increased level of safety to users.

1989- Log #5 FAE-RPE Final Action:
(5.5.2)

Submitter: J. Michael Carlson, TRI Air Testing
Recommendation: Revise text to read as follows:

5.5.2 .When changing the breathing air system's purification components, two air samples shall be taken as required by Section 5.2 Special Testing and Procedures for Maintenance Conditions.

Substantiation: Problem: As currently written it is too easy for users to not understand where to apply the information in section 5.5.2 and its subparagraphs.

Substantiation: Specific reference to the applicable paragraph numbers makes section 5.5.2 clearer to the user.

1989- Log #6 FAE-RPE Final Action:
(A.5.5.3)

Submitter: J. Michael Carlson, TRI Air Testing
Recommendation: Add new text to read as follows:

A5.5.3 Allowing compressed breathing air to flow through the fill hose for 1 minute will purge the line of room air and contaminates. Rubber and other polymeric materials will slowly pass water vapor through their structure by the process of permeation. The amount of water vapor that passes through under a given set of conditions is a function of the surface area of the polymeric material involved This means a longer length of hose will admit more water vapor into the air stream than a shorter length of hose and could result in moisture levels above the requirements of this standard. Therefore, one should try to minimize using long lengths of hose (longer than ten feet). If one does need to use longer lengths of hose the hose should be stored with dry air inside and not open to the atmosphere which contains large amounts of water. Dry air in a stored hose should be under slight positive pressure. High pressure is not required and could be dangerous.

Substantiation: Problem: Some compressed air hoses can be very long such as 100 feet. If open to the atmosphere and then used they can contribute moisture to the compressed air moving through the hose. Users need to be aware that long hoses can lead to out of specification air. Users also need a suggested method to minimize the conditions that could create out of specification air.

Substantiation: In our laboratory we have seen compressed air samples from multiple customers that failed moisture tests where the source of the moisture was attributed to the use of long lengths of hose during the air sampling.

1989- Log #7 FAE-RPE Final Action:
(Chapter X (New))

Submitter: Ronny J. Coleman, FireForceone
Recommendation: Add new text to read as follows:
Add New Chapter to document – proposed title – Firefighter Breathing Air Replenishment Systems Installed in Structures
I envision this chapter consisting of essentially the following language:
Proposed Language for insertion in NFPA Standard 1989:

Include here
Substantiation: I am requesting that NFPA Standard 1989 Breathing Air Quality for Fire Emergency Services Respiratory Protection add an additional chapter to deal with the development of firefighter breathing air replenishment systems that are being installed within complex structures for the purpose of replenishing firefighter air under emergency conditions.
The standard currently states that its purpose is "to establish minimum quality requirements for breathing air, including the sampling and testing methods for determining air quality." Furthermore, section 1.2.2 states "the purpose of this standard shall also be to establish criteria for a safe supply of breathing air for fire and emergency service personnel."
Firefighter breathing air replenishment systems are permanently installed high pressure breathing air systems designed to allow firefighters to replenish their breathing apparatus at the scene of emergencies within close proximity of the incident. These systems are built directly into the structure as a form of "air standpipe" and contain specific breathing air components that have potential impact on firefighter safety.
The NFPA 1500 standards established for SCBA breathing air replenishment within the fire station were naturally transitioned to the Mobile Air Unit in NFPA 1901, bringing the technology for breathing air replenishment closer to the site of an emergency event. This capability has now moved into the next phase by being able to provide SCBA breathing air replenishment within the complex structures themselves via the installation of a firefighter breathing air replenishment system.
A new chapter in 1989 is required to deal with the natural evolution of this relatively new application for breathing air technology. Over 75 firefighting agencies nationwide have already adopted local ordinances and incorporated these systems into a variety of risks. They include: high-rises, subways, tunnels, and mega structures. There are now over 150 known installations in place with a potential for a significant increase in these installations over the next decade. The lack of direct reference within the NFPA process has been identified as a concern. The concern is that without an adequate nationally recognized installation standard, poorly designed breathing air replenishment systems could be installed. This could compromise the safety of firefighters.
Currently there is a document that does describe these systems. That document is the IAPMO - UPC Plumbing Code, 2009 Edition, Appendix F. However, 2009 UPC Plumbing Code is not widely adopted in all of the states in which the fire service is using breathing air replenishment systems to respond to emergencies. As an example, only 14 out of 50 states adopted the UPC code in 2009. The FBARS is currently incorporated as an appendix rather than a chapter, rendering it even less effective. In many areas where local ordinances for firefighter breathing air replenishment systems (FBARS) have been adopted, Appendix F has not been adopted by the Authority Having Jurisdiction. While breathing apparatus and breathing air systems are mentioned in many NFPA Standards, i.e. 1404, 1500, 1981, 1989 and 1901, UPC Appendix F is not cross-referenced to any of the relevant NFPA Standards. There is no correlation or coordination to the NFPA Standards making process. The IAPMO Process does not have the type of firefighter representation that is present in the NFPA Standards making process. It cannot provide the type of reference that is desirable for a technology that is being installed on such a widespread basis. An NFPA document would be more appropriate to contain these requirements.
Increasing interest in this technology is raising the visibility of this need. As recent as the May-June issue of the NFPAs Journal, there was a column by Kathleen H. Almand, writing for The Fire Protection Research Foundation where she states "One of the major tasks of the NFPA's committees and panels is to integrate new technology into our codes and standards." This proposal is an opportunity to accomplish that integration.
If it would be beneficial, we are prepared to send a representative to the next meeting of the NFPA 1989 Committee on October 6-8th in San Diego to present documentation to support this recommendation.

1989- Log #8 FAE-RPE Final Action:
(4.2.3)

Submitter: J. Michael Carlson, TRI Air Testing

Recommendation: Revise text to read as follows:

4.2.3 The accreditation body shall ensure that the laboratory has a written program for callibrating all instruments and devices used for measurement~~, including colorimetric tubes~~.

Substantiation: Problem: Remove redundant text about colorimetric tubes.

Substantiation: The section already says "...all instruments and devices..." so calling out one specific testing technique is unnecessary.