STATE OF WISCONSIN
Department of Safety and Professional Services
1400 E Washington Ave.
Madison WI 53703

Mail to:
PO Box 8935
Madison WI 53708-8935

Email: dsps@wisconsin.gov
Web: http://dsps.wi.gov
Phone: 608-266-2112

Governor Scott Walker **Secretary Dave Ross**

SPS 330 ADVISORY CODE COUNCIL
FIRE DEPARTMENT SAFETY AND HEALTH
Room 121C, 1400 East Washington Avenue, Madison
Contact: Sam Rockweiler (608) 266-0797
October 1, 2013

The following agenda describes the issues that the Council plans to consider at the meeting. At the time of the meeting, items may be removed from the agenda. Please consult the meeting minutes for a description of the recommendations of the Council.

AGENDA

9:00 A.M.

CALL TO ORDER – ROLL CALL

A. Review of Agenda(1-2)

B. Approval of Minutes(3-4)

C. Election of Chair

D. Discuss the Occupational Safety and Health Administration (OSHA) Requirements in 29 CFR 1910.134 and 1910.156; changes to the National Fire Protection Association's standards NFPA 1971, 1981 and 1982; and the Compressed Gas Association's standard CGA G–7.1(5-22)

E. Identify Any Council Issues and Concerns

F. Public Comments

G. Discuss Future Business

H. Adjournment

File reference: SPS 330/Agenda 10.13

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SPS 330 FIRE DEPARTMENT SAFETY AND HEALTH CODE COUNCIL
MEETING MINUTES
AUGUST 14, 2013

PRESENT: Todd Blaser, Gerald Derr, Don Dominick, and Randy McCartney

EXCUSED: Steve Beer and Nate Melby

STAFF: April Hammond, Occupational Safety Inspector; Jim Quast, Program Manager; Sam Rockweiler, Rules Coordinator; and Jeff Weigand, Policy Director

Jeff Weigand called the meeting to order at 9:30 a.m. A quorum of four members was present.

ADOPTION OF AGENDA

Amendments to the Agenda:

- None

MOTION: Todd Blaser moved, seconded by Randy McCartney, to adopt the agenda as published. Motion carried unanimously.

ADJOURNMENT

The meeting adjourned at 2:00 p.m.

File reference: SPS 330/Minutes 08.13

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SPS 330
Referenced Standards

Standard	Adopted Edition	Title	Current Edition
NFPA 1001	1997	Standard for Fire Fighter Professional Qualifications In the 2002 edition of this document, the technical committee made several small additions to the standard. The committee also made changes in the document to bring it into conformance with the *Manual of Style for NFPA Technical Committee Documents.* In the 2008 edition of this document, a complete revision was done. The changes included the following: a skills maintenance requirement was added, specific knot-tying requirements were deleted and replaced with those required by the authority having jurisdiction, the inspection and public education requirements were moved from Chapter 5 to Chapter 6, and the JPR on flow testing of fire hydrants was deleted from Chapter 6. For the 2012 edition of NFPA 1001, the technical committee made several changes, including the use of essential job tasks in consideration for the medical requirement referenced in NFPA 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments*. The one-minute time component for donning personal protective clothing has also been removed as the technical committee believe it is more important to perform the procedure correctly, rather than quickly, to keep the person safe. NFPA 1001 also addresses the activation of an emergency call for assistance so that fire fighters can be located and rescued. And the term *life safety initiatives* replaces *prevention* in Fire Fighter II to bring attention to the greater issue of community risk reduction.	2013
NFPA 1002	1998	Standard for Fire Apparatus Driver/Operator Professional Qualifications In the 2003 edition of the document, the technical committee made changes to bring it into conformance with the new *Manual of Style for NFPA Technical Committee Documents* and	2014

		several small additions. In the 2009 edition of the document, the technical committee made the following changes to meet the Technical Correlating Committee request to standardize the documents within the Professional Qualification Project. The Purpose and Scope statements were rewritten, the term "certification" was replaced with "qualifying," and a skills maintenance requirement was added to Chapter 1. The committee also accepted alternative general requirements for meeting Fire Fighter I with various specific requirements of NFPA 1081, *Standard for Industrial Fire Brigade Member Professional Qualifications*, for fire brigade members for Chapters 5, 6, and 10. The 2014 edition has two significant changes. The technical committee has recognized that not every authority having jurisdiction (AHJ) has the roadway feature capabilities to accomplish the various job requirement tasks to address the various apparatus maneuvers. It is the intent of the committee, when possible, to encourage that all skills be accomplished. The technical committee has also recognized the importance of donning passenger restraint devices to ensure crew safety as part of driver/operator responsibilities.	
NFPA 1021	1997	Standard for Fire Officer Professional Qualifications In preparing the 2003 edition of the document, the technical committee did a task analysis to validate the continued need for the use of four levels in the document. It was found that several tasks were actually being performed at a level lower than indicated in the previous edition. Changes were made to reflect that fact, as well as to bring the document into conformance with the new *Manual of Style for NFPA Technical Committee Documents*. In the 2009 edition of the document, the technical committee revised the Scope statement, added a skill maintenance requirement, and changed the term "certification" to "qualification" as directed by the Technical Correlating Committee to establish conformity across the Professional Qualifications project. The committee revised the duty	2014

		statements for inspection and investigation in Chapters 4, 5, and 6. They also added new JPRs to clarify the committee intent. In the 2014 edition, the technical committee has further clarified the scope of the document to comply with professional qualifications project documents. The technical committee has revised the text of the document as it relates to qualifications for Fire Officer III. The committee has removed the requisite for Fire Service Instructor II for Fire Officer III, indicating that it exceeds the scope for that level. Fire Officer III is considered a managerial/administrative level. A Fire Instructor II has to have the knowledge, skills, and ability to develop individual lesson plans. The technical committee has also made several adjustments to the job performance requirements under Human Resource Management for Fire Officer II and III and Administration and Emergency Services Delivery for Fire Officer IV. The most significant change to this edition has been to acknowledge and encourage prospective fire officers to consider formal higher education as part of their educational and professional growth while maintaining current knowledge.	
NFPA 1403	1997	Standard on Live Fire Training Evolutions in Structures The Fire Service Training Committee appointed a Task Group to review the 1997 edition and make recommendations concerning the functionality of the document. After that review, the Task Group recommended a general updating of NFPA 1402, which was undertaken for the 2002 edition. In addition to minor edits to address the general evolution of the subject, the Committee placed more emphasis in the 2002 edition on needs analysis before design and construction, establishing policies and procedures for effective use of the structure, and the environmental impact of training and training props. New material was added to the chapter on gas-fired burn props. The chapter on design and construction was renamed “Selecting an Architect/Engineer (A/E)” and placed more emphasis on the important roles played by these professionals and on	2012

		the contract documents that form the foundation of projects for building fire service training centers. The chapter on burn buildings was renamed "Live Fire Training Structure" and placed more attention on these structures, especially regarding the impact of repeated high temperatures. The 2007 edition of the guide included updated material on needs and cost analysis, training center components and considerations, and infrastructure considerations and exposures. The guide also included many new and updated illustrations. The 2012 edition includes a rewritten Chapter 7, Design and Construction Process, to aid the user in the workflow. Chapter 10, Live Fire Training Structure, has also been rewritten to clarify some issues and make the document more user friendly, with Section 10.7 including suggested gas-fired live fire training safeguards.	
NFPA 1901	1999	Standard for Automotive Fire Apparatus The 2009 edition of NFPA 1901 is a general update of the 2003 edition. The text has been reorganized to present the requirements better, text has been added to clarify requirements, and the requirements for delivery of documentation and test results with the apparatus have been standardized. Annex material has been added throughout to assist the user in understanding and meeting the requirements. A new chapter on trailers transporting equipment or other vehicles under emergency response conditions has been added, and changes have been made throughout the document where necessary to address the requirements for the vehicle that is going to tow the trailer. A requirement has been added for a vehicle data recorder to capture data that can be used to promote safe driving and riding practices. The requirements for vehicle stability have been changed to require tilt table testing, a calculated center of gravity no higher than 80 percent of vehicle height, or a vehicle stability system. This edition introduces the concept of estimated in-service weight as a basis for designing the apparatus and measuring certain stability requirements and links the maximum	2009

		top speed of the apparatus to the GVWR and agent tank capacity or the tire manufacturer's ratings. A “Statement of Exceptions” requires the manufacturer to deliver either a certification that the apparatus meets the standard or a statement that describes specifically what is not fully compliant and identifies who is responsible for achieving compliance. Because diesel particulate filters are being installed on fire apparatus, requirements for operation and performance of those devices have been added. Requirements for the minimum length of seat belts have been established, together with instruction for how they are measured. A seat belt warning device to indicate when seat belts are not being properly used is required. The new requirements also allow seat belts to be bright orange in addition to red. The cabs on apparatus with a GVWR over 26,000 lb (11,800 kg) must meet standards on occupant protection during crashes. In addition, the document discourages the wearing of fire helmets in the cab and requires provisions for proper storage of helmets while the vehicle is moving. More specific requirements for the retroreflective material used for striping apparatus have been added, and striping on the rear of the apparatus has been changed to require retroreflective striping in a chevron pattern sloping downward and away from the centerline of the vehicle at an angle of 45 degrees. The chapter on industrial supply pumps [rated over 3000 gpm (12,000 L/min)] has been integrated with the chapter on fire pumps [rated 3000 gpm (12,000 L/min) or less], and differences in requirements based on rated capacity are spelled out in the revised fire pump chapter. A requirement has been added for testing the accuracy of the gauges and flowmeters during the pump certification testing. A change to the aerial ladder and elevating platform requirements allows for electronic envelop control, with electronics and interlocks used to prevent an aerial device from moving into an area where it cannot support its rated capacity. Foam systems are required to be type tested for accuracy and certified by	

		the system manufacturer and, after installation, to be tested and certified by the final installer for proper operation. In addition to reorganization of material in the line voltage electrical system chapter for clarification, changes include requiring the protective ground from a shoreline inlet to be bonded to the vehicle frame, requiring the neutral conductor to be switched through the transfer switch if there are multiple power sources, establishing a minimum wire size for cord on permanently mounted reels, requiring fixed scene lighting devices to be tested and listed, and additional testing. In Chapter 24, Air Systems, requirements for who is to train fire department personnel have been revised. A high-temperature alarm is required in the compressor compartment together with a label cautioning users not to obstruct the airflow. Compressors are required to be equipped with an air quality–monitoring system. If a compressor is driven by an electric motor, a shoreline connection to the electric motor is required. High-pressure air hose and couplings are to have a pressure rating equal to or greater than the highest pressure expected to be encountered, with a safety factor of 4 to 1. Requirements for the testing and certification of breathing air fill stations have been changed to add systems filling SCUBA, the section on system testing is now specific to breathing air systems, and a new section has been added for testing utility air systems. See Annex E for a complete history of the standard.	
NFPA 1911	1997	Standard for Service Tests of Pump Systems on Fire Department Apparatus The first edition of NFPA 1911 was issued in 1987 and was titled *Standard on Acceptance and Service Tests of Fire Department Pumping Apparatus*. It incorporated much of the material formerly included in the pamphlet *Fire Department Pumper Tests and Fire Stream Tables*, published by the National Board of Fire Underwriters and later by the Insurance Services Office. In 1991, the requirements for the testing of fire pumps on new fire	2012

		apparatus were transferred to the standards for new fire apparatus. Material previously referenced from other documents was added to make this document self-contained. The requirements were changed to include pumps of 250 gpm (1000 L/min) and larger capacity rated at 150 psi (1000 kPa). The 1997 edition expanded the tables to include data for pumps to 3000 gpm (12,000 L/min), added accuracy requirements for flow and speed measuring equipment, and required a tank-to-pump flow-rate check. The name of the standard was changed to *Standard for Service Tests of Fire Pump Systems on Fire Apparatus* to reflect that components of the pumping system, such as the tank-to-pump piping, were being checked. The 2002 edition added requirements for testing the priming device, the intake relief valve system, and, for pumps rated at 750 gpm (3000 L/min) or more, the pumping engine overload capability.	
NFPA 1914	1997	Standard for Testing Fire Department Aerial Devices	2002
NFPA 1971	2000	Standard on Protective Ensemble for Structural Fire Fighting The 2000 edition was the sixth edition and represented a complete revision to the fifth (1997) edition. Among other changes, the edition introduced new requirements for evaporative heat transfer through garments through a total heat loss test, for evaluating thermal insulation in areas of garments that are most likely to become compressed through a conductive and compressive heat resistance test, for evaluating hand dexterity with gloves through a new hand function test, and for evaluating the durability of barrier materials through additional preconditioning prior to selected physical tests of the barrier materials. The sixth edition was presented to the Association membership at the 1999 Fall Meeting in New Orleans, LA, on November 17, 1999, and issued by the Standards Council with an effective date of February 11, 2000. The 2007 edition of NFPA 1971, the seventh edition, represented a complete revision. The requirements	2013

		of two former standards, the 2000 (sixth) edition of NFPA 1971, *Standard on Protective Ensemble for Structural Fire Fighting*, and the 2000 (second) edition of NFPA 1976, *Standard on Protective Ensemble for Proximity Fire Fighting*, were combined into a single document entitled NFPA 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*. Other than combining the two documents, the major changes represented in the 2007 edition were the *optional requirements* for protection from CBRN terrorism agents (specified chemicals, biological agents, and radiological particulate) that could be released as a result of a terrorism attack. These optional requirements can be selected by fire departments that are concerned about first response of their personnel to such WMD incidents where "normal" fire fighting protective ensembles offer little or no protection from CBRN terrorism agents, and where supplementary protective ensembles that are certified as compliant with NFPA 1994, *Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents*, for protection from CBRN terrorism agents are unlikely to be provided to the vast majority of fire fighting first responders. The CBRN optional protection can be applied only to an entire ensemble, including the specified CBRN SCBA for that ensemble, and cannot be applied to individual ensemble elements. The design and performance of the entire ensemble including the CBRN SCBA provides the CBRN protection for the wearer and depends on the proper use of the entire ensemble to accomplish this protection. No combination of individual ensemble elements short of the entire assembled ensemble will give CBRN protection. These optional CBRN requirements that apply to both structural fire fighting protective ensembles and proximity fire fighting protective ensembles are built into the construction of the "basic" fire fighting protective ensemble elements so that nothing has to be added to or subtracted from the basic fire fighting protective clothing in order to achieve the protection from CBRN terrorism	

		agents. The optional CBRN requirements do not decrease any of the protection for the fire fighting environments in which these ensembles are used. The 2007 edition was presented to the Association membership at the 2006 Association Annual Meeting in Orlando, Florida, on June 7, 2006, and issued by the Standards Council with an effective date of August 17, 2006. The 2013 edition of NFPA 1971 represents a complete revision of the document, incorporating many technical and editorial changes. In addition to several new definitions and revised labeling requirements, changes have been made to the performance requirements in Chapter 7, including those for garment zippers, fastener tape, and helmets. Performance requirements for the radiant reflective protective areas of proximity fire fighting protective glove elements also have been added. A number of tests in Chapter 8 have been revised, including glove test areas, the flame resistance test procedure, the glove hand function test procedure, and the slip resistance test. The chemical permeation test and the man-in-simulant test (MIST) also have been completely revised. New tests have been added to Chapter 8, including a torque test, transmitted and stored thermal energy test, fastener tape strength test, and a glove tool test.	
NFPA 1981	1997	Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service The fourth edition, presented to the Association membership at the 1997 Annual Meeting in Los Angeles, California, incorporated new requirements for surrogate cylinders to replace the actual breathing gas cylinders during the vibration testing to ensure a higher level of safety during this rigorous test. A new requirement for redundant end-of-service-time indicators (EOSTI) was added to provide a better level of safety in case of failure of one end-of-service-time indicator. The fifth edition of NFPA 1981 was presented to the NFPA membership at the 2002 Annual Meeting in Minneapolis, Minnesota, on May 19, 2002. That edition incorporated new	2013

		requirements for heads-up displays (HUD) that provide visual information and warnings to SCBA wearers of the status of the SCBA's air supply and, where the HUD is powered by a power source, the power source status. Those new requirements were in response to fire service requests for the provision of user-friendly information for SCBA wearers so they can better understand their environment and limitations. Also in response to strong fire service input to the Committee, new requirements were specified for a single universal air connection located in a specific position on all new SCBA certified as compliant with the 2002 edition of NFPA 1981, and existing SCBA that could be upgraded and certified as compliant with the 2002 edition of NFPA 1981. The RIC UAC [RIC stands for *rapid intervention company* or *crew* (sometimes called RIT for *rapid intervention team*, or FAST company or crew); UAC stands for *universal air connection*] permits the breathing air cylinder of an SCBA user to be replenished from an independent rescue breathing air supply source when the SCBA user is trapped or unable to be removed from a hazardous atmosphere. The RIC UAC does not take breathing air from an SCBA being worn by a member of the rescue operation but replenishes the victim's breathing air cylinder from a source of "rescue breathing air," such as a rescue breathing air cylinder or a high-pressure breathing air supply line. The RIC UAC is not a "buddy breathing" device — it does not permit the sharing of a single SCBA breathing air source between two persons. NIOSH does not permit or certify any buddy breathing system that allows two users to share a single breathing air source. Because NFPA 1981 requires NIOSH certification as a prerequisite to become certified as compliant with NFPA 1981, NFPA cannot permit buddy breathing systems, which would be in violation of NIOSH regulations. The Committee continued to review and revise text for improved clarity and specificity, improved accuracy in testing and test result reporting, and added additional criteria to better evaluate and test the EOSTI. In 2002, NFPA revised the format for its codes and standards, resulting in	

		chapter, section, and paragraph numbers not matching or corresponding to those of previous editions. The 2007 edition of NFPA 1981, the sixth edition, represented a complete revision and retitling of the standard as NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*. While the Committee made several significant changes to the standard, a major change in the 2007 edition was the mandatory requirement for all emergency services SCBA to also be NIOSH certified as CBRN SCBA in accordance with the NIOSH *Statement of Standard for NIOSH CBRN SCBA Testing*. This requirement provided respiratory protection from CBRN terrorism agents (specified chemicals, biological agents, and radiological particulates) that could be released as a result of a terrorism attack. Although major metropolitan areas are more likely targets of a terrorist event, emergency responders from smaller communities could be called upon to respond to urban areas where the emergency services have become overwhelmed by a terrorist incident. Terrorists themselves might be residing in smaller communities while they await the opportunity to strike, and if they have chemical, biological, or nuclear material in their possession, the possibility of exposure is even greater for those small, rural areas. Terrorist attacks aside, CBRN-certified SCBA offer greater protection for emergency services personnel at minimal cost. CBRN certification offers verification of enhanced protection for emergency responders that is not otherwise available. Without CBRN protection evaluation, SCBA components are not tested for permeation, penetration, corrosion resistance, or other detrimental effects from exposure to toxic industrial chemicals during hazardous materials incidents and hazardous chemical warfare atmospheres. NIOSH benchmark testing of non-CBRN-hardened SCBA against CBRN agents demonstrated that chemical warfare agents (CWA) could cause catastrophic failures within minutes of exposure. NIOSH's selection of the test	

		challenge agents for CBRN protection was based on a comprehensive review of available technical data and consultations with other government agencies [e.g., Department of Defense (DoD), Department of Justice (DoJ), and Department of Energy (DoE)]. Various chemical data lists were analyzed, including lists from the Environmental Protection Agency (EPA); the Agency for Toxic Substances and Disease Registry (ATSDR); NFPA 1994, *Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents*; the U.S. Army Center for Health Promotion and Preventative Medicine (USACHPPM) Technical Guide 244; and other, classified sources. That analysis identified a total of 151 toxic industrial chemicals (TICs) and CWA as potential candidates for challenge agents. The candidate agents were evaluated for permeation (molecularly diffusing through material) and penetration (seeping through interfacing components) characteristics as part of a review of their physical properties. This evaluation concluded that Sarin (GB) and sulfur mustard (HD) could be selected as the two representative agents for the penetration/permeation test for the complete listing of 151 CWA and TICs due to their physical properties and molecular structure. NIOSH is unaware of any data that indicate that CBRN-certified SCBA provide less protection against TICs than their industrial counterparts. The evaluation for CBRN protection provides verification and assurance that the component and material combinations in the approved SCBA configurations provided high resistance to permeation and penetration of hazardous atmospheres of TICs and materials into the breathing air. This is of importance to all responders subject to extreme exposures to any hazardous industrial chemicals and materials. In addition to the new CBRN requirement, the following significant requirements were added to increase the safety to the users of emergency services SCBA and to better assure the proper functioning of the SCBA: (1)	

		New breathing air cylinder retention requirement within the mounted position (2) Mechanical voice diaphragm performance requirement increased to 80 percent minimum score at 1.5 m (4.9 ft) distance (3) New voice communications system with at least an 85 percent score at 3 m (10 ft) distance (4) New independent pressure gauge that would not be affected by failure of the heads-up display (HUD) (5) New water immersion requirements for electronic devices that are part of the SCBA that must function properly and remain watertight after six exposures to 177°C (350°F) for 15 minutes and water submersion to 1.5 m (4.9 ft) (6) New low power capacity requirements for electronic devices to assure that such devices will continue to function properly for at least 2 hours following activation of the low power source signal The 2013 edition of NFPA 1981, the seventh edition, represents a complete revision of the standard. Among the many changes included in this edition is a new section on Emergency Breathing Safety Systems (EBSS), in response to correspondence that the Technical Committee on Respiratory Protection Equipment received from the National Institute for Occupational Safety and Health (NIOSH) that indicated NIOSH's intention to modify its existing policy on buddy breathers. For the complete text of this letter, please see the NFPA 1981 F12 *Report on Comments* (ROC), 1981–1, LOG #21. Also in this edition are new definitions	

		for terms related to speech intelligibility, including speech transmission index (STI), sound pressure level (SPL), mouth reference point (MRP), and microphone measurement point (MMP). The technical committee has also modified the performance requirements for the nonelectronic communications performance test and the supplementary voice communications system performance test. Several additional new tests have been added, including an emergency breathing safety system cold temperature performance test, a lens radiant heat test, and a lens convective heat and flame resistance test.	
NFPA 1982	1998	Standard on Personal Alert Safety Systems (PASS) The fourth edition represented a complete revision of the third edition and included PASS that are integrated with SCBA and automatic activation of all PASS. It was presented to the membership of the Association at the 1998 Annual Meeting in Cincinnati, Ohio, and had an effective date of August 5, 1998. In October 2002, the NFPA Standards Council established a new committee, the Technical Committee on Electronic Safety Equipment, within the project structure. This new committee was given the responsibility for addressing all electronics in equipment used by emergency responders and was assigned responsibility for NFPA 1982. The fifth edition of NFPA 1982 represented a complete revision of the fourth edition. During this revision cycle, the Committee received reports from the National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research, regarding their investigations of fire fighter fatalities where there was evidence the PASS alarm signal failed to function or was not heard by other personnel in the area, and in some instances that there was water ingress to the electronic components that diminished or canceled the alarm signal. The National Institute for Standards and Technology (NIST), Building and Fire Research Laboratory, partnered with NIOSH to characterize the performance of PASS devices in the fire-fighting	2013

		environment. NIST determined that exposure to high-temperature environments caused the loudness of the alarm signal to be reduced. This reduction in loudness can cause the alarm signal to become indistinguishable from background noise at an emergency scene. Initial laboratory testing by NIST highlighted that this sound reduction could begin to occur at temperatures as low as 300°F. All PASS devices that were evaluated experienced significant alarm signal degradation at temperatures between 300°F and 500°F. As the PASS cooled, the alarm signal on most of the units returned to pre-exposure sound levels. NIOSH and others also noted that water ingress did occur or could have occurred in several cases, causing the alarm signal to cease to function with any effectiveness, but that after the PASS electronics dried, the alarm signal would again function. The Committee addressed these issues and others and developed changes to the requirements for the fifth edition. The more significant changes were the following: (1) New water immersion requirements and testing where PASS is exposed to 350°F for 15 minutes and then to water submersion in 1.5 m (4.9 ft) also for 15 minutes for each of six cycles. PASS is then examined to determine no water ingress, that all PASS signals function properly, and that electronic data logging functions operate properly. PASS is then re-immersed in the test water for an additional 5 minutes with the power source compartment(s) open; following those 5 minutes, the PASS is removed from water and wiped dry, and the electronics compartment is opened and examined to determine no water ingress. (2) Revised high-temperature resistance requirements and added new high-temperature functionality requirements and testing procedures where PASS is exposed to 500°F for 5 minutes while mounted in a circulating hot air oven. The PASS alarm signal must function	

		at or above the required 95 dBA sound level for the required duration of the signal, electronic data logging functions must operate properly, and no part of the PASS can show evidence of melting, dripping, or igniting. (3) New tumble–vibration requirements and testing in which PASS is "tumbled" in a rotating drum for 3 hours. The PASS alarm signal must function at the required 95 dBA sound level, and electronic data logging functions must operate properly. (4) New requirements to prevent muffling of the alarm signal where PASS is mounted on a test subject and evaluated in five positions (face down with arms extended, supine left, supine right, fetal right with knees drawn to chest, fetal left with knees drawn to chest), and the alarm signal must function at or above the required 95 dBA sound level in each of the positions. The sixth (2013) edition of NFPA 1982 represents a complete revision of the fifth edition. During this revision cycle, the Technical Committee received reports from the National Institute for Standards and Technology (NIST) on technical changes with respect to the testing of PASS. The 2013 edition has added the minimum requirements for RF PASS, devices that are capable of transmitting a distress alarm and receiving an evacuation alarm via an RF signal. New definitions in this edition include *RF PASS*, *base station*, *evacuation alarm*, *loss-of-signal alarm*, *RF interference*, and *RF transceiver*. In addition, the informational references in Annex B have been updated to include NIST publications. In Chapter 4, the test matrices for stand-alone, removable, and nonremovable integrated PASS have been updated, and in Chapter 6, alarm signals have been revised. In Chapter 8, several new test methods have been added, including radio system tests for RF PASS, loss-of-	

		signal alarms, and an RF interference test for optional RF PASS.	
NFPA 1983	2001	Standard on Fire Service Life Safety Rope and System Components The fourth (2001) edition of NFPA 1983 added a new type of rope — a throwline — a floating rope intended to be thrown to a person in water or used as a tether for rescuers during water rescue incidents. New requirements for pulleys and portable anchors were also added to the fourth edition as new items of system components. The former terminology for one- and two-person load classifications was changed to a simpler load classification based on the weight that the rope or system is designed to support. In the 2001 edition, testing methods for descent control devices were modified to provide more accurate testing for the three types of descenders. Other testing modifications were made throughout Chapter 6 to clarify testing methods and improve reproducibility of testing results. The 2001 edition also included new requirements for improved product quality assurance through manufacturer's being registered as compliant with the ISO, and certification laboratory accreditation. Annual product evaluation, testing, and recertification were also added. All three of these new criteria were directed to raise the bar for product and certification quality and to provide a better level of safety for the end users. Throughout the 2001 edition, modifications to existing text were made in the continuing attempt to make the document clearer, less ambiguous, and easier to use by both manufacturers and the certification organizations. This process continues during every revision cycle, and the input received from document users has been very helpful in fixing many of these issues. The 2001 edition was acted on by the Association membership at the Fall Meeting in Orlando, Florida, on November 15, 2000, and was issued with an effective date of February 9, 2001. With the fifth (2006) edition of NFPA	2012

		1983, the title of the document was changed to *Standard on Life Safety Rope and Equipment for Emergency Services,* to reflect the broader audience for this type of equipment. The 2006 edition continued to refine design and performance criteria and test methods. The former approach of system components was changed to all items being independent and tested according to the type of use to which they could be subjected. Labeling requirements were specified for items that can have detachable components to better advise the user to be sure that all components are assembled properly in order to safely use the equipment. Throughout the 2006 edition document, modifications to existing text were made in the continuing attempt to make the document clearer, less ambiguous, and easier to use by both manufacturers and the certification organizations. This process continues during every revision cycle and the input received from document users has been very helpful in fixing many of these issues. The 2006 edition was issued by the NFPA Standards Council on January 27, 2006, with an effective date of February 16, 2006. The 2012 (sixth) edition of NFPA 1983 features editorial changes, new definitions, and current terminology. It also has several new performance requirements in Chapter 7, including those for litters, escape webbing, fire escape webbing, victim extrication devices, escape systems, fire escape rope, manufacturer-supplied eye termination, moderate elongation laid life saving rope, belay devices, and escape anchor devices. The related test methods for these items have also been added to Chapter 8.	
CGA G-7.1	1997	Commodity Specification for Air	2011

File reference: SPS 330/Referenced Standards