Report on Proposals A2007 — Copyright, NFPA

Report of the Committee on
Fire Service Occupational Safety and Health

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1583-1
Submitter: Technical Committee on Fire Service Occupational Safety and Health,
Recommendation: The Technical Committee on Fire Service Occupational Safety and Health proposes a complete revision to NFPA 1583, Standard on Health-Related Fitness Programs for Fire Fighters, 2000 edition including revising the document to comply with the NFPA Manual of Style. The title of the revised document is being changed to Standard on Health-Related Fitness Programs for Fire Department Members.

See draft at the end of this report.

Substantiation: The committee reviewed the document and updated it to reflect current practices in health related fitness programs for fire department members and to editorially revise the document to comply with the current NFPA Manual of Style. The title is being changed to Standard on Health-Related Fitness Programs for Fire Department Members to use the term “member” which is a defined term used throughout the Fire Service Occupational Safety and Health Committee’s documents.

Revisions to Chapter 1 include reorganization of the material to get the appropriate material into the application section and to introduce the concept that, while a health and fitness program should require mandatory participation, it should be non-punitive. Paragraphs 1.2.3, 1.3.1 and 1.3.2 were moved to section 4.1 as they dealt more with program issues.

The referenced publications were moved from Chapter 8 to Chapter 2 and revised as appropriate.

The definitions were moved from Section 1.4 to Chapter 3 and updated in many cases to reflect how the term is being used by the NFPA Fire Service Occupational Safety and Health Committee. The following definitions were deleted as the term is not used in the document.

Candidate.
Communicable Disease.
Component.
Composite Program.
Confidential Data.
Drug.
Facility.
Fire Department Facility.
Health Database.
Infection Control Program.
Member Organization.
Mortality.
Occasionally Assigned.
Occupational Illness.
Primarily Assigned.
Related Activities.
Risk Management.
SCBA.
Self-Contained Breathing Apparatus (SCBA).

A new definition for Industrial Fire Brigade was added (see 3.3.13 in the draft)

Chapter 3 (renumbered as chapter 5) was expanded to include peer fitness trainers and a section added on their qualifications and responsibilities. The relationship between the HFC and the fire department physician was clarified.

Chapter 4 (renumbered as chapter 6) added a requirement for the member to advise the health and fitness coordinator (HFC) of any medical condition or disease that may limit their ability to participate in an annual fitness assessment and for the HFC to respect that members medical confidentiality.

Chapter 5 (renumbered as chapter 7) added a requirement for the HFC to design an individualized exercise and fitness training program for a member returning to full duty from a debilitating injury, illness, or any other extended leave. Paragraphs 5.2.2 and 5.2.3 were deleted as they were deemed to be outside the scope of the document.

In A.2.4.2, the list of exercise equipment was deleted and the annex material reorganized to focus on the fire department providing an adequate facility.

In A.3.2.1, the long list of qualifications for the HFC was deleted in favor of a statement that suggests a background in functional anatomy, exercise physiology, exercise testing and prescription, exercise supervision and leadership. The document is encouraging the HFC to be certified and allowing the certification organization to establish the needed qualifications.

Other materials in Annex A were reviewed and updated to reflect current thinking on the subject.

A new Annex C was added as a self assessment tool for use by members to monitor their individual fitness level.

Committee Meeting Action: Accept
Number Eligible to Vote: 31
Ballot Results: Affirmative: 28
Ballot Not Returned: 3 Norris, S., Turen, C., Wood, H.
**FORM FOR COMMENTS ON NFPA REPORT ON PROPOSALS**

**2007 ANNUAL REVISION CYCLE**

**FINAL DATE FOR RECEIPT OF COMMENTS:** 5:00 pm EDST, September 1, 2006

For further information on the standards-making process, please contact the Codes and Standards Administration at 617-984-7249

For technical assistance, please call NFPA at 617-770-3000

**FOR OFFICE USE ONLY**

Log #: ____________________
Date Rec’d: ____________________

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Please indicate in which format you wish to receive your ROP/ROC ☐ electronic ☐ paper ☐ download

(Note: In choosing the download option, you intend to view the ROP/ROC from our website; no copy will be sent to you.)

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2. Comment on Proposal No. (from ROP):

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4. Comment (include proposed new or revised wording, or identification of wording to be deleted): (Note: Proposed text should be in legislative format; i.e., use underscore to denote wording to be inserted (inserted wording) and strike-through to denote wording to be deleted (deleted wording).

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5. Statement of Problem and Substantiation for Comment: (Note: State the problem that will be resolved by your recommendation; give the specific reason for your comment, including copies of tests, research papers, fire experience, etc. If more than 200 words, it may be abstracted for publication.)

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6. Copyright Assignment

   (a) ☐ I am the author of the text or other material (such as illustrations, graphs) proposed in this comment.

   (b) ☐ Some or all of the text or other material proposed in this comment was not authored by me. Its source is as follows (please identify which material and provide complete information on its source):

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I hereby grant and assign to the NFPA all and full rights in copyright in this comment and understand that I acquire no rights in any publication of NFPA in which this comment in this or another similar or analogous form is used. Except to the extent that I do not have authority to make an assignment in materials that I have identified in (b) above, I hereby warrant that I am the author of this comment and that I have full power and authority to enter into this assignment.

Signature (Required) ____________________

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PLEASE USE SEPARATE FORM FOR EACH COMMENT • NFPA Fax: (617) 770-3500

Mail to: Secretary, Standards Council, National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471

5/25/2006
Notice of Intent to Make a Motion (NITMAM)

Sequence of Events Leading to Issuance of an NFPA Committee Document

Step 1  Call for Proposals

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

Step 2  Report on Proposals (ROP)

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

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

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

Step 3  Report on Comments (ROC)

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

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

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

Step 4  Technical Report Session

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

▼ NFPA membership meets each June at the Annual Meeting Technical Report Session and acts on Technical Committee Reports (ROP and ROC) for Documents with "certified amending motions."

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

Step 5  Standards Council Issuance

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

▼ Standards Council decides, based on all evidence, whether or not to issue Document or to take other action, including hearing any appeals.
The Technical Report Session of the NFPA Annual Meeting

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

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

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

The NFPA Annual Meeting, also known as the World SafetyConference and Exposition®, takes place in June of each year. A second Fall membership meeting was discontinued in 2004, so the NFPA Technical Report Session now runs once each year at the Annual Meeting in June.

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

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

Consent Documents. Often there are codes and standards up for consideration by the membership that will be non-controversial and no proper Notices of Intent to Make a Motion will be filed. These “Consent Documents” will bypass the Technical Report Session and head straight to the Standards Council for issuance. The remaining Documents are then forwarded to the Technical Report Session for consideration of the NFPA membership.

Important Note: The filing of a Notice of Intent to Make a Motion is a new requirement that takes effect beginning with those Documents scheduled for the Fall 2005 revision cycle that reports to the June 2006 Annual Meeting Technical Report Session. The filing of a Notice of Intent to Make a Motion will not, therefore, be required in order to make a motion at the June 2005 Annual Meeting Technical Report Session. For updates on the transition to the new Notice requirement and related new rules effective for the Fall 2005 revision cycle and the June 2006 Annual Meeting, check the NFPA website.
**Action on Motions at the Technical Report Session.** In order to actually make a Certified Amending Motion at the Technical Report Session, the maker of the motion must sign in at least an hour before the session begins. In this way a final list of motions can be set in advance of the session. At the session, each proposed Document up for consideration is presented by a motion to adopt the Technical Committee Report on the Document. Following each such motion, the presiding officer in charge of the session opens the floor to motions on the Document from the final list of Certified Amending Motions followed by any permissible Follow-Up Motions. Debate and voting on each motion proceeds in accordance with NFPA rules. NFPA membership is not required in order to make or speak to a motion, but voting is limited to NFPA members who have joined at least 180 days prior to the session and have registered for the meeting. At the close of debate on each motion, voting takes place, and the motion requires a majority vote to carry. In order to amend a Technical Committee Report, successful amending motions must be confirmed by the responsible Technical Committee, which conducts a written ballot on all successful amending motions following the meeting and prior to the Document being forwarded to the Standards Council for issuance.

**Standards Council Issuance**

One of the primary responsibilities of the NFPA Standards Council, as the overseer of the NFPA codes and standards development process, is to act as the official issuer of all NFPA codes and standards. When it convenes to issue NFPA documents it also hears any appeals related to the Document. Appeals are an important part of assuring that all NFPA rules have been followed and that due process and fairness have been upheld throughout the codes and standards development process. The Council considers appeals both in writing and through the conduct of hearings at which all interested parties can participate. It decides appeals based on the entire record of the process as well as all submissions on the appeal. After deciding all appeals related to a Document before it, the Council, if appropriate, proceeds to issue the Document as an official NFPA code or standard. Subject only to limited review by the NFPA Board of Directors, the Decision of the Standards Council is final, and the new NFPA code or standard becomes effective twenty days after Standards Council issuance. The illustration on page 9 provides an overview of the entire process, which takes approximately two full years to complete.
Chapter 1 Administration

1.1* Scope. This standard establishes the minimum requirements for the development, implementation, and management of a health-related fitness program (HRFP) for members of the fire department involved in emergency operations.

1.2 Purpose.

1.2.1 The purpose of this standard is to provide the minimum requirements for a health-related fitness program for fire department members that enhances the members’ ability to perform occupational activities efficiently and safely and reduces the risk of injury, disease, and premature death.

1.2.2* This document is intended to assist fire departments to develop a health-related fitness program for fire department members that requires mandatory participation but is non-punitive.

1.2.3 This document is not intended to establish physical performance criteria.

1.3 Application.

1.3.1 The requirements of this standard apply to organizations providing rescue, fire suppression, emergency medical services, hazardous materials mitigation, special operations, and other emergency services, including public, military, private, and industrial fire departments.

1.3.2 This standard does not apply to industrial fire brigades that might also be known as emergency brigades, emergency response teams, fire teams, plant emergency organizations, or mine emergency response teams.

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications.

2.2.1 National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

2.2.2 NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2007 edition.

2.2.3 NFPA 1582, Standard on Comprehensive Occupational Medical Program for Fire Departments, 2007 edition.

2.3 Other Publications.


2.4 References for Extracts in Mandatory Sections.

2.4.1 NFPA 1582, 2007 edition.

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. Merriam-Webster’s Collegiate Dictionary, 11th edition, shall be the source for the ordinarily accepted meanings.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3 Shall. Indicates a mandatory requirement.

3.2.4 Should. Indicates a recommendation or that which is advised but not required.

3.3 General Definitions.

3.3.1 Delegating Illness or Injury. A condition that temporarily or permanently prevents a member of the fire department from engaging in normal duties and activities as a result of illness or injury. [1500, 2007]

3.3.2 Emergency Operations. Activities of the fire department related to rescue, fire suppression, emergency medical care, and special operations, including response to the scene of the incident and all functions performed at the scene. [1500, 2007]

3.3.3 Fire Chief. The highest ranking officer in charge of a fire department. [1710, 2004]

3.3.4* Fire Department. An organization providing rescue, fire suppression, and related services.

3.3.5 Fire Department Member. See 3.3.17, Member.

3.3.6 Fire Department Physician. The licensed doctor of medicine or osteopathy who has been designated by the fire department to provide professional expertise in the areas of occupational safety and health as they relate to emergency services. [1582, 2007]

3.3.7* Fire Suppression. The activities involved in controlling and extinguishing fires. [1500, 2007]

3.3.8* Hazard. A condition that presents the potential for harm or damage to people, property, or the environment.

3.3.9 Health and Fitness Coordinator. The person who, under the supervision of the fire department physician, has been designated by the department to coordinate and be responsible for the health and fitness programs of the department. [1500, 2007]

3.3.10* Health and Safety Officer. The member of the fire department assigned and authorized by the fire chief as the manager of the safety and health program. [1500, 2007]

3.3.11 Health Promotion. Preventive activities that identify and potential health risks in the work environment and that inform, motivate, and otherwise help people to adopt and maintain healthy practices and lifestyles.

3.3.12* Health-Related Fitness Program (HRFP). A comprehensive program designed to promote the member’s ability to perform occupational activities and to reduce or eliminate hazards.

3.3.13 Industrial Fire Brigade. An organized group of employees within an industrial occupancy who are knowledgeable, trained, and skilled in at least basic fire fighting operations, and whose full-time occupation might or might not be the provision of fire suppression and related activities for their employer. [600, 2005]

3.3.14 Infectious Disease. An illness or disease resulting from invasion of a host by disease-producing organisms such as bacteria, viruses, fungi, or parasites. [1500, 2007]

3.3.15 Medical Evaluation. The analysis of information for the purpose of making a determination of medical certification. Medical evaluation includes a medical examination. [1582, 2007]

3.3.16 Medical Examination. An examination performed or directed by the fire department physician. [1582, 2007]

3.3.17* Member. A person involved in performing the duties and responsibilities of a fire department under the auspices of the organization. [1500, 2007]

3.3.18 Member Assistance Program (MAP). A generic term used to describe the various methods used in the fire department for the control of alcohol and substance abuse, stress, and personal problems that adversely affect member performance. [1500, 2007]

3.3.19* Morbidity. The state of being diseased.

3.3.20 Occupational Injury. An injury sustained during the performance of the duties, responsibilities, and functions of a fire department member. [1500, 2007]

3.3.21 Procedure. An organizational directive issued by the authority having jurisdiction or by the department that establishes a specific policy that must be followed. [1561, 2005]

3.3.22 Punitive. Inflicting or aiming to inflict punishment or sanctions.

3.3.23 Qualified Person. A person who, by possession of a recognized degree, certificate, professional standing, or skill, and who, by knowledge, training, and experience, has demonstrated the ability to deal with problems relating to a particular subject matter, work, or project. [1451, 2002]

3.3.24 Risk. A measure of the probability and severity of adverse effects that result from an exposure to a hazard. [1451, 2002]

3.3.25 Standard Operating Procedure. An organizational directive that establishes a course of action or policy. [1561, 2005]

Chapter 4 Organization

4.1 Program Overview.

4.1.1* The fire department shall establish and provide a health-related fitness program (HRFP) that enables members to develop and maintain a level of health and fitness to safely perform their assigned functions.

4.1.2 The fire chief shall have the ultimate responsibility for the fire department’s health-related fitness program as required by NFPA 1500, Standard on Fire Department Occupational Safety and Health Program.

4.1.3 When this standard is adopted by a jurisdiction, the authority having jurisdiction shall set a date or dates for achieving compliance with the requirements of this standard and shall be permitted to establish a phase-in schedule for compliance with specific requirements of this standard.

4.1.4 Nothing in this standard shall restrict any jurisdiction from exceeding the requirements set forth herein.
6.2.2* If a member has an acute medical problem or a newly acquired chronic medical condition, the fitness assessment shall be postponed until that person has recovered from this condition and is cleared as required by 6.2.1.

6.3 Pre-Assessment Questionnaire. The health and fitness coordinator shall administer to all members a pre-assessment questionnaire that seeks to identify contraindications for participation in the fitness assessment and department exercise training program.

6.4* Fitness Assessment Components. The annual fitness assessments shall consist of the following components:

(1) Aerobic capacity
(2) Body composition
(3) Muscular strength
(4) Muscular endurance
(5) Flexibility

Chapter 7 Exercise and Fitness Training Program

7.1* Program Components. The fire department’s exercise and fitness training program, administered by the department health and fitness coordinator, shall consist of the following components:

(1) Educational program that describes the components and benefits of exercise on performance and health
(2) Individualized exercise prescription based on the results of the fitness assessment
(3) Warm-up and cool-down exercise guidelines
(4) Aerobic exercise program
(5) Muscular resistance (strength, endurance) exercise program
(6) Flexibility exercise program
(7) Healthy back exercise program
(8) Safety and injury prevention program

7.2 Program Participation.

7.2.1 The fire department physician shall clear all members for participation in the exercise and fitness training program as directed by NFPA 1582, Standard on Comprehensive Occupational Medical Program for Fire Departments.

7.2.2 After a member returns to full duty from a temporary injury, illness, or any other extended leave, the health and fitness coordinator shall design an individualized exercise and fitness training program under direction of the department physician or other attending health care professional, in order to facilitate restoration of the member’s fitness to an optimal level.

Chapter 8 Health Promotion Education

8.1* General Requirements. The fire department shall provide health promotion education as an integral part of the health-related fitness program.

8.1.1* The fire department shall provide for the education of members regarding health risk reduction, general health maintenance, fitness, and the prevention of occupational injuries, illnesses, accidents, or fatalities.

8.1.2* The fire department, under the direction of the fire department physician, shall provide education regarding all of the topics in 8.1.1.

8.1.3 Materials on the matters in 8.1.1 shall be made available to all members on an ongoing basis, with resource materials updated periodically to ensure current information.

8.1.4 The fire department shall provide education and guidance regarding access to the department’s member assistance program (MAP) as required by NFPA 1500, Standard on Fire Department Occupational Safety and Health Program.

8.1.5 The fire department shall encourage all members to obtain ongoing health care from their primary care providers.

Chapter 9 Data Collection

9.1* General. The fire department shall ensure that a confidential fitness program file is established and maintained for each member.

9.2 Statistical Summary. Group statistical data shall be permitted to be used for administrative purposes only as long as it is coded so as not to reveal any member’s personal information.

9.3* Data Collected. The individual health-related fitness program file shall record the following:

(1) Demographic information
(2) Pre-assessment questionnaire
(3) Fitness assessment
(4) Program participation data

Annex A Explanatory Material

Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.1.1 Although this standard is intended primarily for members involved in emergency operations, fire departments are encouraged to apply the components of the health-related fitness program to all employees.

A.1.2.2 The intent of this program is to promote health and fitness in a “mandatory, nonpunitive” manner. “Mandatory, nonpunitive” implies a program with universal participation; however, failure to achieve defined or individual fitness objectives should not be the basis for any employment sanctions, discipline, or other punitive actions.

A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining

Chapter 6 Fitness Assessment

6.1 General.

6.1.1 All members shall participate in a periodic fitness assessment under supervision of the fire department health and fitness coordinator.

6.1.1.1 Members shall discuss any physical limitations or concerns with the health and fitness coordinator in order to assist with the development of an individual exercise prescription.

6.1.1.2 Any medical condition or disease process that can limit a member’s ability to safely participate in the annual fitness assessment should be addressed by the fire department physician or the member’s treating physician as appropriate.

6.1.1.3 The member’s medical confidentiality shall be respected by the health and fitness coordinator.

6.1.2 The fitness assessment shall be conducted at least annually.

6.2 Fitness Assessment.

6.2.1 All members shall be cleared annually for participation in the fitness assessment by the fire department physician as directed by NFPA 1582, Standard on Comprehensive Occupational Medical Program for Fire Departments.

Chapter 5 Health and Fitness Coordinator and Peer Fitness Trainers

5.1 Assignment.

5.1.1 The fire chief shall appoint a health and fitness coordinator (HFC).

5.1.2* The health and fitness coordinator shall be either a member of the fire department or a qualified outside agent.

5.1.3 The health and fitness coordinator shall have access to the fire department physician or other subject matter expert for consultation.

5.1.4 The health and fitness coordinator shall be the administrator of all components of the health-related fitness program.

5.1.5* The health and fitness coordinator shall act as a direct liaison between the fire department physician, or other subject matter expert, and the fire department.

5.1.6* The health and fitness coordinator shall act as a direct liaison to the fire department’s health and safety officer.

5.2* Qualifications for Health and Fitness Coordinator.

5.2.1* The health and fitness coordinator shall have access to appropriate educational materials and formal certification from a professional organization, relevant educational experience, appropriate academic degrees, completion of course work relevant to the program components, or attendance at workshops related to health and fitness.

5.2.2 The health and fitness coordinator shall maintain the continuing education requirements dictated by the coordinator’s certifying body or as described in the fire department’s job description, whichever sets forth the higher standard.

5.3 Peer Fitness Trainers.

5.3.1 Peer fitness trainers shall work under the direction of the health and fitness coordinator to oversee safe participation in health-related fitness programs.

5.3.2 Peer fitness trainers shall implement and oversee fitness programs to academy recruits as directed by the department health and fitness coordinator.

5.3.3* Peer fitness trainers shall have the level of training and certification required by the fire department and shall maintain their recertification requirements as prescribed by the certifying organization.
A.4.4.2 The fire department can allocate time on duty for physical fitness training. Scheduling of this time can vary due to emergency calls, training, and other activities.

(3) The fire department should maintain equipment owned or leased by the fire department.

A.4.4.2.1 The fire department can allocate time on duty for physical fitness training. Scheduling of this time can vary due to emergency calls, training, and other activities.

There are no broadly accepted educational standards for health and fitness personnel in the United States. While it would be an unrealistic and unattainable goal to require that all health and fitness coordinators have a baccalaureate or graduate degree in a related discipline, it is important to note the level of formal training such a degree connotes.

A.5.2.1 A number of professional organizations, including those listed in Table A.5.2.1, provide training and educational experiences as well as certification programs for interested persons. It is in the best interests of fire departments to avail themselves of these professional services, as time and resources allow.

Table A.5.2.1 Professional Organizations Providing Training

<table>
<thead>
<tr>
<th>Organization</th>
<th>Training Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>American College of Sports Medicine</td>
<td>Personal Trainer, Health and Fitness Instructor, Exercise Specialist</td>
</tr>
<tr>
<td>American Council on Exercise (ACE)</td>
<td>Personal Trainer</td>
</tr>
<tr>
<td>National Strength and Conditioning Association (NSCA)</td>
<td>Certified Strength and Conditioning Specialist (CSCS) or Certified Personal Trainer (CPT)</td>
</tr>
<tr>
<td>National Academy of Sports Medicine</td>
<td>Personal Trainer</td>
</tr>
</tbody>
</table>

The health and fitness coordinator should have a background in functional anatomy, exercise physiology, exercise testing and prescription, exercise supervision, and leadership.

A.5.3.3 A minimum level of certification can be obtained from American Council on Exercise (ACE) as recommended by the IAFF/IAFC Wellness/Fitness Initiative.

A.6.2.2 This requirement is consistent with NFPA 1582, Standard on Comprehensive Occupational Medical Program for Fire Departments, requiring the postponement of medical evaluation for acute medical problems.

A.6.4 The IAFF in conjunction with the IAFC have developed a Wellness/Fitness Initiative for the fire service. The initiative gives a department a template for developing a comprehensive fitness program. (Annex C provides a self-assessment tool for determining fitness levels.) The following includes examples from the IAFF/IAFC Wellness/Fitness Initiative as well as examples of other fitness assessment protocols, which vary in terms of ease of use, validity, and cost.

(1) Aerobic capacity including the following:

(a) 1 mile walk
(b) 1.5 mile run/walk
(c) 12-minute run
(d) Step test (various)
(e) Stairclimbing machine
(f) Cycle ergometer (various)
(g) Treadmill (various)

(2) Body composition as follows:
(a) Skinfold (various)
(b) Circumference (various)
(c) Bioimpedance (BIA)
(d) Hydrostatic weighing
(e) Body mass index (optional)
(f) Waist-to-hip ratio (optional)

(3) Muscular strength as follows:
(a) Handgrip dynamometer
(b) Static bicep curl with dynamometer
(c) Static leg press with dynamometer
(d) Bench press (1 rep maximum or percent of body weight)
(e) Leg press (1 rep maximum or percent of body weight)

(4) Muscular endurance including the following:
(a) Push-ups
(b) Strengthened push-ups
(c) Pull-ups
(d) Bent knee sit-ups
(e) Crunches/curl-ups given time or cadence

(5) Flexibility including the following:
(a) Sit and reach
(b) Lateral and rotation movement
(c) Trunk extension
(d) Shoulder elevation

A.7.1 See Annex B for further information about each component of the fire department’s exercise program. The health and fitness coordinator in setting up and administering such a program.

A.8.1 Health education is now the driving force of health promotion and disease prevention. In the fall of 1993, the Centers for Disease Control (CDC) formally added “Prevention” to its name. At that time the CDC director announced that prevention’s time had come in America. Coincident with this, third-party payors had begun to recognize the value of preventive education and began to reimburse for preventive services and risk reduction counseling. Organizations that establish health care guidelines in this country, such as the U.S. Prevention Services Task Force and American Association of Family Practitioners, unanimously agree that most clinical evaluation time for the average nonpregnant adult should be spent on counseling. It is in that spirit that this technical committee is promoting health education as a major part of the health-related fitness program.

A.8.1.1 It is understood that the degrees of resources vary greatly between fire departments. Despite such differences, adequate low-cost opportunities are universally available to satisfy this standard.

The individualized exercise prescription should include the following:

(1) Health-related components of fitness as follows:
(a) Aerobic capacity
(b) Muscular strength
(c) Muscular endurance
(d) Flexibility
(e) Body composition

(2) Motor-related components of fitness as follows:
(a) Coordination
(b) Agility
(c) Power
(d) Balance
(e) Speed

B.2 Individualized Exercise Prescription Based on the Fitness Assessment.

The components of a basic exercise prescription should include the following:

(1) Mode: type of exercise
(2) Intensity: difficulty of the exercise
(3) Duration: length of exercise session
(4) Frequency: number of sessions per day or week
(5) Progression: gradual increases in workload to promote a training adaptation

The individualized exercise prescription should take into consideration the following concepts:

(1) Overload. To create a training effect, the exercise performed must exceed the load the individual normally experiences. Excessive overload can lead to training injuries; therefore, it is best to underestimate workload and err on the side of safety.
(2) Progression. As adaptations to the load take place, the load must be progressively increased in order to continue adaptations and improvements. Programs should progress gradually to avoid overtraining and injuries.
(3) Specificity. Overload training leads to adaptations in the muscles and the physiological systems. The adaptations are specific to the manner in which the performance is used. This principle of training will be very important for individuals who need to target a specific aspect of fitness.
(4) Targeting the Improvement of Health and Fitness. Programs designed to improve health will not necessarily improve fitness. However, any properly designed exercise training program designed to improve fitness will also have a positive impact on overall health. The Surgeon General’s Report on Physical Activity and Health states that physical activity need not be strenuous to improve health, although greater health and fitness benefits can be achieved by increasing the amount of physical activity. Since a high level of physical fitness is essential for safely performing fire-fighting duties, a fitness program designed for those who work in public safety personnel should promote health and a high level of physical fitness. The workout regimen should include exercises to improve aerobic capacity and muscular fitness components (i.e., strength, endurance, flexibility).

B.3 Warm-Up and Cool-Down Exercise.

B.3.1 Pre-Exercise (Warm-Up). Each workout session should include at least a 5- to 10-minute warm-up period. The purpose of the warm-up is to increase body temperature while improving the flow of blood and oxygen to the muscles. A warm-up prepares the body for the more strenuous exercise to follow, decreases risk of injury, and improves performance.

B.3.2 Post-Exercise (Cool-Down). A 10- to 15-minute cool-down period should follow each workout. This period includes a gradual tapering of exercise intensity followed by stretching. The purpose of the cool-down is to assist in the return of blood to the heart, thereby reducing cardiac stress.

B.4 Aerobic Fitness.

B.4.1 Significance. Aerobic exercise has many benefits, including increased...
studies evaluating fire fighters' heart rate response to fireground activities find that heart rates range from 80 to 90 percent of maximal heart rate or 70 to 80 percent of VO₂ max. Therefore, a fire fighter should consider progressing to a program that includes some high-intensity efforts.

B.4.5 Duration. The duration of the workout can be determined by time, distance, or calories expended. Exercise duration is integrally related to exercise intensity, and together they determine the total number of calories burned in an exercise session. Total caloric expenditure can also be used to help determine exercise intensity and duration. The ACSM recommends 20 to 60 minutes of continuous activity, excluding the warm-up and cool-down periods. Unfit individuals can benefit from multiple sessions of less than 10 minutes until they are able to withstand training of a longer duration.

B.4.6 Frequency. Exercise frequency is related to the intensity and duration of the exercises as well as individual time constraints and goals. Persons with very low fitness levels will benefit from multiple workouts per day, because they have to exercise at a low intensity and short duration due to lack of fitness. Two to three short workouts per day could be most appropriate. The ACSM recommends a minimum of three aerobic workouts per week to improve fitness and maintain current fitness levels. Workouts should be performed on consecutive days in order to allow adequate recovery between sessions. Weight training exercises can be performed on the days following the aerobic workout.

B.4.7 Weekly Caloric Expenditure. One goal of an exercise program can be a reduction in body fat. The total weekly caloric expenditure, which is determined by exercise intensity, duration, frequency, and mode, can also be used as a tool to determine the exercise prescription. The ACSM recommends a minimal caloric expenditure of 300 calories per exercise session performed three times a week or 200 calories per session performed four times a week. The Surgeon General's Report on Physical Activity and Health recommends an accumulated exercise expenditure of 10,000 calories per week to improve health. A more optimal level to improve performance is an expenditure of 2000 calories a week.

B.4.8 Rate of Progression. According to the ACSM, the following considerations should be made when determining the proper rate of progression for an individual: (1) Medical, health, and coronary risk status (2) Functional capacity (3) Musculoskeletal conditions (4) Age (5) Individual goals and preferences (6) Specificity to occupational demands. Progressions can come in the form of increases in intensity, duration, and frequency, or a change in mode of exercise (e.g., running instead of cycling). Progressions should be gradual to avoid training injuries.

B.5 Muscle Fitness.

B.5.1 Significance. Components of muscle fitness include muscular strength, endurance, and flexibility. The demands of fire fighting require an above-average level of muscular strength and endurance. Increases in bone, muscle, and connective tissue strength and density decrease the risk of soft tissue injuries. Fire fighters have to be pull, drag, and carry heavy loads. Improved muscular fitness will improve job performance and decrease the likelihood of injuries.

B.5.2 Definitions.

B.5.2.1 Maximal Voluntary Contraction (MVC). Maximal amount of weight that can be lifted in a single voluntary muscular contraction.

B.5.2.2 Muscular Endurance. The ability of the muscle to perform repeated contraction for a prolonged period of time; the ability of the muscle to persist. B.5.2.3 Muscular Strength. Maximal amount of force a muscle or group of muscles can exert in a single contraction; the ability to apply force.

B.5.2.4 National Strength and Conditioning Association (NSCA). A national association of exercise physiologist and health professionals who review the body of information generated on muscle fitness training and provide recommendations and position statements for exercise testing protocols and training programs.

B.5.2.5 Repetition Maximal (RM). The maximal number of repetitions that can be completed with a given weight. For example, if 150 lb is a 10 RM load on the bench press, a person could lift 150 lb at least 10 times but no more than 10 times, using proper lifting form.

B.5.2.6 Repetition (Rep). The lifting and then lowering of a weight.

B.5.2.7 Rest Interval. The period of rest that could include stretching or light activity between sets and different exercises. (See definition B.4.2.3, Interval Training)

B.5.3-1 SET. A series of repetitions completed without rest.

B.5.3.1 Exercise Prescription.

B.5.3.1.1 Mode. Free weights, machine weights, circuit training, and calisthenics using body weight or tools and equipment from the fireground (e.g., hose, ladder, bundles), or anything that provides a resistance that the fire fighters handle.

B.5.3.2 Frequency. The number of workouts per week.

B.5.3.3 Intensity. How hard an individual exercises can be determined by monitoring exercise heart rate, perceived exertion, or caloric expenditure. The ACSM recommends exercising at a heart rate between 70 to 90 percent of maximal heart rate or 50 to 85 percent of VO₂ max, or heart rate reserve. Karvonen formula, which is used to calculate the heart rate of individuals with proper equipment or facilities

B.5.3.4 Duration. The duration of the workout can be determined by time, distance, or calories expended. Exercise duration is integrally related to exercise intensity, and together they determine the total number of calories burned in an exercise session. Total caloric expenditure can also be used to help determine exercise intensity and duration.

B.5.4.1 Aerobic Fitness. Enhancement of the body's ability to take in, transport, and utilize oxygen; improved stamina or ability to carry out muscular activity without prolonged periods of time. Aerobic fitness is also referred to as cardiovascular fitness and cardiopulmonary endurance, is generally measured by the maximal oxygen consumption test (VO₂ max).

B.5.4.2 American College of Sports Medicine (ACSM). A national organization of exercise physiologists and health practitioners who review the body of studies on exercise physiology and present exercise testing guidelines as well as exercise prescription recommendations and position statements.

B.5.4.2.1 Aerobic Fitness. Components of cardiorespiratory fitness include any activities that utilize large muscle groups in a rhythmical continuous manner (e.g., walking, running, swimming, cycling, rowing, stairclimbing, skating, dancing, cross-country skiing, rope skipping) are all endurance-based activities. Training can also be carried out in an interval-style fashion. Employing a variety of training modes will reduce the chance of workout boredom and overuse injuries.

B.5.4.3 Interval Training. A method of training in which periods of high-intensity effort (work interval) are alternated with periods of lower intensity (rest interval). These intervals are performed repeatedly for a given number of repetitions. For example, a 1-minute jog (work interval) followed by a 1-minute walk (rest interval), performed a total of 10 times (10 repetitions).

B.5.4.4 Karvonen Formula. A formula used to predict the heart rates that represent approximately 50 to 85 percent of VO₂ max. This rate is considered an appropriate range to promote aerobic fitness improvements.

B.5.4.5 Maximal Oxygen Consumption Level (VO₂ max). The maximal amount of oxygen that can be consumed and utilized per minute. It is also measured in milliliters per kilogram of body weight per minute. Direct or gas exchange VO₂ (max) measurement is considered the best indicator of aerobic fitness. Indirect VO₂ testing is a more common method of assessing aerobic fitness, which typically utilizes a formula to predict VO₂ from time and workload.

B.5.4.6 Frequency. Exercise frequency is related to the intensity and duration of the exercises as well as individual time constraints and goals. Persons with very low fitness levels will benefit from multiple workouts per day, because they have to exercise at a low intensity and short duration due to lack of fitness. Two to three short workouts per day could be most appropriate. The ACSM recommends a minimum of three aerobic workouts per week to improve fitness and maintain current fitness levels. Workouts should be performed on consecutive days in order to allow adequate recovery between sessions. Weight training exercises can be performed on the days following the aerobic workout.

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B.5.4.8 Rate of Progression. According to the ACSM, the following considerations should be made when determining the proper rate of progression for an individual: (1) Medical, health, and coronary risk status (2) Functional capacity (3) Musculoskeletal conditions (4) Age (5) Individual goals and preferences (6) Specificity to occupational demands. Progressions can come in the form of increases in intensity, duration, and frequency, or a change in mode of exercise (e.g., running instead of cycling). Progressions should be gradual to avoid training injuries.

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B.5.5.2.6 Repetition (Rep). The lifting and then lowering of a weight.

B.5.5.2.7 Rest Interval. The period of rest that could include stretching or light activity between sets and different exercises. (See definition B.4.2.3, Interval Training)

B.5.5.3-1 SET. A series of repetitions completed without rest.

B.5.5.3 Muscular Fitness Exercise Prescription.

B.5.5.3.1 Mode. Free weights, machine weights, circuit training, and calisthenics using body weight or tools and equipment from the fireground (e.g., hose, ladder, bundles), or anything that provides a resistance that the fire fighters have to overcome can be used to improve muscle fitness. The exercise modalities given here will be separated into the following four groups:

(1) Free Weights. Use of free weights (e.g., dumbbells and bar bells) requires a balance between the individual and the weight during lifting, which results in greater use of musculoskeletal muscles who resist forceful exertions. Balancing the individual and the weight improves strength transfer to real-life movements, whether for recreational, sport, or work activities. Free weights generally are less expensive to purchase and
maintain. A spotter is necessary in several lifts, and the risk of injury can be more serious.

(2) Circuit Weight Training. This regimen is a type of interval training in which strength, local muscle endurance, cardiorespiratory endurance, and reductions in body fat can be accomplished. Free weights, machine weights, and calisthenics can be used in a circuit. Participants perform a series of exercises organized to work all the major muscle groups. The lifting or work period will be 15 to 30 seconds long, and rest intervals between exercises will vary from 15 seconds to 1 minute, depending on which element of fitness is to be emphasized.

(3) Machine Weights. Machine weights provide improved convenience of lifting and safety, and they are easier to learn than free weights. Additionally, spotters are not necessary. Machine weights do not simulate the real-life conditions as well as free weights, but they do improve muscular fitness, which in turn should improve a fire fighter’s ability to lift effectively and safely on the fireground. Machine weights are more expensive to purchase and maintain than free weights.

(4) Calisthenics. Calisthenics use an individual’s body weight to provide resistance to the muscles. Although no special equipment is required and calisthenics are generally quite safe to perform, resistance is limited by an individual’s body weight. Therefore, calisthenics are not necessarily as effective for improvements in strength. Job-specific tasks such as pulling a hose or raising a ladder are very specific to job tasks. However, they are not as convenient or safe to use for all training purposes. The load or intensity is often difficult to control or manipulate.

B.5.3.2 Exercise Selection. A combination of all the modes of training described in B.5.3.1 can be the most beneficial, especially for a fire fighter who needs to train specifically for job tasks but who also desires a safe and convenient training regimen. Regardless of what mode of training is used, a program should be balanced and complete. A minimum of one exercise should be included for each of the following movements:

- Upper-body push
- Upper-body pull
- Lower-body thrust and extension using the hip and knee joint
- Knee flexion (hamstrings)
- Anterior trunk (abdominal)
- Posterior trunk (lower back)

B.5.3.3 Intensity. Using the principle of repetition maximal (RM), the weight or resistance should be such that at least 5 repetitions can be completed, but no more than 20 repetitions can be performed, with a given weight (5–20 RM). Exceptions would occur during warm-up sets and sets performed by novice lifters, as well as returning from an injury or individuals with a low fitness level. These types of sets can be performed with lighter loads that would allow more repetitions as follows:

1. To emphasize the development of strength, a weight that allows 5 to 8 repetitions, or is a 5–8 RM load, should be used. Complete 3 to 6 sets of each exercise.
2. To emphasize the development of muscular endurance, a weight that allows a minimum of 10 repetitions, or a 10 RM load, should be used. Complete 3 to 6 sets of each exercise.
3. To emphasize proper warm-up, a light weight that allows 8 to 10 repetitions should be used. Complete 1 to 2 warm-up sets for each exercise.

B.5.3.4 Duration. The internal volume of lifts (i.e., number of sets, repetitions, and sets completed) should determine the exercise duration, which can last from 20 to 90 minutes. The mode of training can also be a factor in determining duration. Circuit training and use of weight machines can provide a faster workout.

B.5.3.5 Rest Interval Between Workouts. A minimum of 48 hours between workouts of the same muscle should be allowed. Exceptions include the forearms, calf, and abdominal muscles, which can be exercised more frequently.

B.5.3.6 Rest Interval Between Sets and Exercises. More rest between sets and exercises is needed at the beginning of a program, after an injury, during a multijoint lift (e.g., squat), or when lifting heavier weights to emphasize strength. The following guidelines can be used to determine rest intervals between sets and exercises:

- Strength: 2 to 3 minutes of rest between sets and exercises
- Endurance: 2 minutes of rest between sets and exercises
- Circuit program: 15 to 30 seconds of rest between exercises

B.5.3.7 Training Frequency. According to NSCA, B.5.3.7 Training Frequency.

- Two or more days per week be devoted to muscular fitness training.
- Training sessions a week are required to maintain or make gains. The frequency of training depends on all of the following factors:
  1. Initial level of conditioning
  2. Individual goals
  3. Health status of the athlete
  4. Volume and load of exercises
  5. Type of movement performed (multijoint vs. single-joint)

B.5.3.8 Rate of Progression. All exercise programs should start gradually in order to ease through the initial stages of the body’s adaptation to the stress of exercise. Resistance training is no exception, as it follows the same stages described in the aerobic training section. However, the method of increasing the workload will include one or several of the following factors:

1. Increased resistance (weight)
2. Increased repetitions
3. Increased sets
4. Decreased rest interval between sets
5. Increased frequency of training
6. Change in exercises or training mode

B.6 Flexibility.

B.6.1 Significance. Flexibility measures the range of a joint in a motion, which determines the extensibility of soft tissues (i.e., muscles, tendons, and ligaments). Lack of flexibility can hinder physical performance or contribute to an increased risk of injury. Benefits of stretching include the following:

1. Relaxation from stress and tension
2. Improved circulation
3. Relief of lower back pain
4. Relief of muscle soreness
5. Improved coordination
6. Improved job performance
7. Reduced risk of injury

B.6.2 Flexibility Exercise Prescription.

B.6.2.1 Static Stretch. A slow, gradual, constant stretch in which the end position is held for 10 seconds or longer. Static stretching is easy to learn, safe, and effective and is the recommended stretching mode for fire fighters.

B.6.2.2 Ballistic Stretch. A bouncing movement in which the end position is never reached. This movement is designed to create a rapid stretch of the muscles. It involves the same types of stretches utilized in static stretching, but it uses rapid or bouncing movements to elongate the muscle. Ballistic stretching can produce injuries to muscles or connective tissue, especially when a previous injury is involved.

B.6.2.3 Dynamic Stretch. Dynamic stretching utilizes movement, but it includes sports-specific movements or simulates a movement pattern used in an activity. Dynamic stretching can be beneficial to include in warm-up after muscles are warm and static stretching has been completed. Ballistic or dynamic stretching should not be substituted for the static mode.

B.6.3 Proprioceptive Neuromuscular Facilitation Stretch (PNF). Alternation of muscle contraction and relaxation of both the agonist (muscle being stretched) and antagonist (muscle in opposition to the stretch) muscles, resulting in further relaxation of the muscle being stretched. This interaction results in a decrease in resistance and an increase in the range of motion. This type of stretching generally requires a partner and more time to learn. The partner must be experienced in PNF techniques in order to prevent injuries. Some studies indicate that PNF is superior to static stretching in improving range of motion.

B.6.4 Flexibility Exercise Prescription.

B.6.4.1 Mode. The static stretching technique is safe and effective and is therefore the recommended method of improving flexibility. If personnel trained in the PNF method of training are available, stretching can be even more effective. To stretch the muscle statically and slowly, the muscle should be relaxed to a point of tension in the muscle (i.e., not pain), hold for at least 5 seconds, and release. After the initial 10 seconds, the stretch should be lengthened a little further, and held another 10 seconds or longer. Each stretch should be repeated two to three times.

B.6.4.2 Intensity. Individuals should stretch to the point of tension, not pain. No increase in range of motion will occur if no gain definitely does not apply here. The stretch should be felt in the belly of the muscle and not at the joint.

B.6.4.3 Duration. Each stretch should be held at least 10 seconds, then progressed to 30 seconds or longer. Completing a stretching program for the whole body will take approximately 10 to 15 minutes.

B.6.4.4 Frequency. Stretching can and should be done daily. After the initial warm-up, stretching exercises will prepare the body for the more strenuous workout to follow. Stretching after a workout improves flexibility and decreases muscle soreness. A minimum of three stretching workouts a week will generally improve flexibility.

B.6.5 Progression. To progress in the flexibility program, increases should be made in the duration of the stretch to more than 10 seconds, in the number of repetitions (up to five repetitions), or in the frequency of stretching. Flexibility can be maintained by stretching at least three times a week, especially before and after workouts. Conducting weight training activities using a full range of motion in each exercise will also help maintain flexibility.

B.6.6 Stretching Tips. The following tips can be helpful in making stretching safe and effective:

1. Always warm up muscles with an activity that elevates heart rate and muscle temperature before starting stretching.
2. Cold muscles should not be stretched.
3. The breath should not be held while stretching. Relaxing and slow breathing should be encouraged.
4. Proper technique and posture/alignment should be used when stretching.
5. Stretching a muscle should be discontinued if a dull ache or burning sensation that could indicate a tissue tear is experienced.

B.7 Healthy Back Exercise Program.
The following are general guidelines for prevention of injuries while working out.

B.7.1 Significance. Approximately 5 million Americans suffer from acute or chronic back pain, which accounts for over 90 million lost production days annually. A report by M. Karter in the NFP A Journal found that lower back sprains and strains were the most common type of injury. The physical demands placed on fire fighters puts them at great risk especially if they are not adequately conditioned.

The following are common causes of lower back pain and injury:

1. Weak abdominal and/or lower back muscles
2. Inflexible lower back, hamstrings, and hip flexor
3. Improper body mechanics

B.7.2 Mode. Strengthening and stretching exercises, and exercises that improve aerobic fitness to lessen or prevent fatigue, are general prescriptions in a healthy back exercise program. Specific exercises to strengthen the lower back, abdominal region, and the muscles in the trunk region.

B.7.3 Intensity. All exercises should be carried out at a low to moderate intensity. Proper form, not high intensity, should be emphasized. Each exercise should be completed in a slow, controlled manner. All stretching should follow the prescription for static stretching.

B.7.4 Duration. Exercise should continue for 10 to 20 minutes, depending on the number of exercises and stretches.

B.7.5 Frequency. Healthy back exercises should be carried out three to five times a week. As mentioned previously, these exercises can be inserted into any warm-up routine.

B.7.6 Progression. Stretches can be progressed by holding longer and gradually stretching further. Calisthenics and trunk strengthening exercises can be increased by completing more repetitions, or sets, or by adding light weights. The frequency of training can also be increased. Ten minutes of stretching and trunk strengthening exercises three times a week will maintain levels; twenty minutes per week to lessen the risk of a back injury is an excellent time investment. Cardiovascular and weight training exercises will also contribute to maintenance of a healthy back.

B.7.7 Improper Body Mechanics. Improper posture or lifting mechanics are often the result of weak and inflexible muscles. Strengthening the trunk region and improving flexibility will improve body mechanics.

B.7.8 Using Weight Belts. Recommendations for strength training involving the use of weight belts are as follows:

1. For exercises not stressing the back, a belt should not be worn.
2. For exercises directly stressing the back, a belt should not be worn during lighter sets but always worn for near maximal and maximal sets.
3. It should be noted that a weight belt will afford protection against improper lifting techniques.

B.8 Safety and Injury Prevention.

The following are general guidelines for prevention of injuries while exercising:

1. Warm-up and stretching exercises should be performed before a workout. The exercise intensity and stretch should be gradually tapered after a workout.
2. Members should not overestimate their abilities when beginning an exercise program. Start out slow and ease gradually increasing the exercise intensity and duration. Longevity is paramount.
3. Chronic muscle soreness and fatigue are signs of overtraining. They indicate the need to reduce the workout stimulus, to increase the recovery period between workouts or both. The body's messages should be listened to.
4. Properly fitting exercise equipment and clothing should always be worn.
5. Performing the same workout routine should be avoided. Variety not only reduces boredom but also avoids overuse-type injuries. Periodically changing the modes of exercise, the intensity, and the duration of workouts is required. Changing body mechanics also issues a new challenge to the body, resulting in continued improvements.

Annex C Self-Assessment Tool

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

C.1 General.

A self-assessment gives the member valuable feedback on their individual fitness level, ability to recover from exertion, and overall physical capacity as it pertains to their job and the demands placed on them. The information collected in the assessment is valuable to uniformed personnel because it can be compared to previous and future assessments. If an individual’s heart rate at 1 minute exceeds 90 percent of the estimated maximum, that individual could lack the reserve necessary to perform safely on the fireground. Similarly, if an individual is unable to complete repetitions of a task, that individual could be unable to sufficiently complete the essential task that the exercise simulates. This information should be used to motivate the member to improve any deficiencies noted during the evaluation.

A self-assessment is a major component of the wellness program. The personalized exercise prescription should be a progressive plan that accounts for an individual’s current level of fitness as determined from the self-assessment, job duties, time restrictions, physical capabilities, nutritional status, and self-improvement.

C.2.1 Example of Circuit Exercise Assessment Test.

One type of self-assessment is a circuit test. A member who is going to perform a circuit self-assessment test should be medically cleared to participate in the assessment. Prior to beginning the assessment, the member should warm up properly. The following protocol should be followed by the member:

Once the test has begun, move from one station to the next with no more than 30 seconds between events. Movements with weights should be through the full range of motion, and both the concentric and eccentric contractions.

Prior to performing the self-evaluation, assemble the following equipment:

1. Heart rate monitor
2. Dumbbells (pairs of 15 lb, 20 lb, 30 lb, and 35 lb)
3. Treadmill (capable of 5 mph and 15 percent grade)
4. Lat pulldown machine (set at 80 lb)
5. Flat bench

Place the equipment conveniently close to the treadmill since you will be returning to this piece of equipment throughout the assessment.

Wet the heart receiver and put it on your chest. Tighten it to a comfortable setting. Turn on the watch and be sure it is receiving your heart rate.

Now you are ready to begin the assessment. Remember that you will be recording both your time and your heart rate. Therefore, you should move at as brisk a pace as you feel comfortable between events.

Get your self-assessment worksheet (see Figure C.2) and mark the date. Keep this sheet with you as you proceed so you can record your heart rate immediately after each event.

The steps of the self-assessment are as follows:

1. Straddle the treadmill and start the belt. Be sure to set the exercise time to 20 minutes so it can run continually during your evaluation. Set the speed for 3.5 mph while you increase the incline to 15 percent. As soon as the belt reaches 2 mph you can step on the treadmill. Once the incline reaches 15 percent, increase the speed to 5 mph. As soon as the speed hits 5 mph begin timing your assessment.
2. Run on the treadmill at 5.0 mph on a 15 percent grade for 1 minute. At the end of 1 minute, reduce the speed to 3.5 mph and step off the treadmill. Record your heart rate and measure the 15 lb dumbbell.
3. Pick up the 15 lb dumbbells and perform 24 biceps curls with both arms simultaneously. Do not swing your arms or upper body. Be sure to move through the full range of motion. After the 24th repetition, record your heart rate.
4. Walk on treadmill for 1 minute at 3.5 mph on a 15 percent grade. At the completion of 1 minute, record your heart rate and move onto the dumbbell (DB) row.
5. Place your left knee and left arm on the flat bench and pick up the 30 lb dumbbell with your right hand. Keep your chest parallel to the ground and pull the dumbbell upward and into your lower chest. Perform 24 repetitions with your right arm and then repeat with your left arm. Record your heart rate and move onto the treadmill.
6. Walk on treadmill for 1 minute at 3.5 mph on a 15 percent grade. At the completion of 1 minute, record your heart rate and move onto the DB military press.
7. Pick up the 20 lb dumbbells and in a standing position perform 24 repetitions (with each arm) of alternating military press. Record your heart rate and move onto the treadmill.
8. Walk on treadmill for 1 minute at 3.5 mph on a 15 percent grade. At the completion of 1 minute, record your heart rate and move onto the lat pulldown.
9. Bend down using your legs and pickup both 35 lb dumbbells (one in each hand). Carry the dumbbells to a mark 6 ft away and set them down on the ground. Turn, pick up the dumbbells, and return to the starting line. Repeat this for 10 repetitions. Each time you set down the dumbbells is one repetition. Record your heart rate and record onto the treadmill.
10. Walk on treadmill for 1 minute at 3.5 mph on a 15 percent grade. At the completion of 1 minute, record your heart rate and move onto the lat pulldown.
11. Sit down with knees secured and grasp the straight lat pulldown bar with your palms supinated so they are facing away. Pull down in front of your body until the bar reaches your chin. Perform 24 repetitions being sure to go all the way up. Record your total time and heart rate.
**SELF-ASSESSMENT WORKSHEET**

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Heart Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treadmill at 15 percent and 5 mph for 1 min.</td>
<td></td>
</tr>
<tr>
<td>DB curls with 15 lb, 24 reps (standing — both arms)</td>
<td></td>
</tr>
<tr>
<td>Treadmill at 15 percent and 3.5 mph for 1 min.</td>
<td></td>
</tr>
<tr>
<td>DB rows with 30 lb, 24 reps (each arm)</td>
<td></td>
</tr>
<tr>
<td>Treadmill at 15 percent and 3.5 mph for 1 min.</td>
<td></td>
</tr>
<tr>
<td>DB military press with 20 lb, 24 reps (standing — alternating arms)</td>
<td></td>
</tr>
<tr>
<td>Treadmill at 15 percent and 3.5 mph for 1 min.</td>
<td></td>
</tr>
<tr>
<td>DB carry with 35 lb, 10 reps (pickup/carry 6 ft)</td>
<td></td>
</tr>
<tr>
<td>Treadmill at 15 percent and 3.5 mph for 1 min.</td>
<td></td>
</tr>
<tr>
<td>Lat pulldown at 80 lb, 24 reps (close grip/palms towards face)</td>
<td></td>
</tr>
<tr>
<td>1 minute of recovery (sitting quietly)</td>
<td></td>
</tr>
<tr>
<td>2 minutes of recovery (sitting quietly)</td>
<td></td>
</tr>
<tr>
<td>3 minutes of recovery (sitting quietly)</td>
<td></td>
</tr>
<tr>
<td>4 minutes of recovery (sitting quietly)</td>
<td></td>
</tr>
<tr>
<td>5 minutes of recovery (sitting quietly)</td>
<td></td>
</tr>
</tbody>
</table>

Name:

<table>
<thead>
<tr>
<th>Date</th>
<th>Start Time</th>
<th>Finish Time</th>
</tr>
</thead>
</table>

**Figure C.2 Self-Assessment Worksheet.**
Interpreting Your Results. Interpret your results as follows:

1. Determine 85 percent of your estimated maximum heart rate, which will be the target exercise heart rate, using the following simple Karvonen Method equation:

\[
\text{Target exercise heart rate} = 0.85 \times (220 - \text{age})
\]

Example: The target exercise heart rate of a 40-year-old individual is:

\[
\text{Target exercise heart rate} = 0.85 \times (220 - 40) = 153
\]

2. Observe your heart rate throughout the test and see if it ever goes over your 85 percent value. If your heart rate is near maximal it could indicate that you need to work on your cardiovascular conditioning. This indicates that you have very little reserve if some greater demand occurred on the fireground.

3. Observe each event and see if you completed the required number of repetitions. If you could not complete the required number of repetitions you need to work on your muscular strength and/or endurance in these muscle groups.

4. Observe your total time and compare it to your last total time. If your total time for this test is less than your last test and your heart rate response is the same or less, your fitness level has improved.

5. Observe your 5-minute recovery. A heart rate that recovers quickly is indicative of aerobic fitness. If your 5-minute heart rate is less than your last test, your fitness level has improved.