NFPA 405

Standard for the Recurring Proficiency of Airport Fire Fighters

2004 Edition



NFPA, 1 Batterymarch Park, Quincy, MA 02169-7471
An International Codes and Standards Organization

--`,,,,,,,-`-`,,`,,`,`,,`---

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS

Not for Resale

IMPORTANT NOTICES AND DISCLAIMERS CONCERNING NFPA DOCUMENTS

NOTICE AND DISCLAIMER OF LIABILITY CONCERNING THE USE OF NFPA DOCUMENTS

NFPA codes, standards, recommended practices, and guides, of which the document contained herein is one, are developed through a consensus standards development process approved by the American National Standards Institute. This process brings together volunteers representing varied viewpoints and interests to achieve consensus on fire and other safety issues. While the NFPA administers the process and establishes rules to promote fairness in the development of consensus, it does not independently test, evaluate, or verify the accuracy of any information or the soundness of any judgments contained in its codes and standards.

The NFPA disclaims liability for any personal injury, property or other damages of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication, use of, or reliance on this document. The NFPA also makes no guaranty or warranty as to the accuracy or completeness of any information published herein.

In issuing and making this document available, the NFPA is not undertaking to render professional or other services for or on behalf of any person or entity. Nor is the NFPA undertaking to perform any duty owed by any person or entity to someone else. Anyone using this document should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances.

The NFPA has no power, nor does it undertake, to police or enforce compliance with the contents of this document. Nor does the NFPA list, certify, test or inspect products, designs, or installations for compliance with this document. Any certification or other statement of compliance with the requirements of this document shall not be attributable to the NFPA and is solely the responsibility of the certifier or maker of the statement.

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

ADDITIONAL NOTICES AND DISCLAIMERS

Updating of NFPA Documents

Users of NFPA codes, standards, recommended practices, and guides should be aware that these documents may be superseded at any time by the issuance of new editions or may be amended from time to time through the issuance of Tentative Interim Amendments. An official NFPA document at any point in time consists of the current edition of the document together with any Tentative Interim Amendments and any Errata then in effect. In order to determine whether a given document is the current edition and whether it has been amended through the issuance of Tentative Interim Amendments or corrected through the issuance of Errata, consult appropriate NFPA publications such as the National Fire Codes® Subscription Service, visit the NFPA website at www.nfpa.org, or contact the NFPA at the address listed below.

Interpretations of NFPA Documents

A statement, written or oral, that is not processed in accordance with Section 6 of the Regulations Governing Committee Projects shall not be considered the official position of NFPA or any of its Committees and shall not be considered to be, nor be relied upon as, a Formal Interpretation.

Patents

The NFPA does not take any position with respect to the validity of any patent rights asserted in connection with any items which are mentioned in or are the subject of NFPA codes, standards, recommended practices, and guides, and the NFPA disclaims liability for the infringement of any patent resulting from the use of or reliance on these documents. Users of these documents are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.

NFPA adheres to applicable policies of the American National Standards Institute with respect to patents. For further information contact the NFPA at the address listed below.

Law and Regulations

Users of these documents should consult applicable federal, state, and local laws and regulations. NFPA does not, by the publication of its codes, standards, recommended practices, and guides, intend to urge action that is not in compliance with applicable laws, and these documents may not be construed as doing so.

Copyrights

This document is copyrighted by the NFPA. It is made available for a wide variety of both public and private uses. These include both use, by reference, in laws and regulations, and use in private self-regulation, standardization, and the promotion of safe practices and methods. By making this document available for use and adoption by public authorities and private users, the NFPA does not waive any rights in copyright to this document.

Use of NFPA documents for regulatory purposes should be accomplished through adoption by reference. The term "adoption by reference" means the citing of title, edition, and publishing information only. Any deletions, additions, and changes desired by the adopting authority should be noted separately in the adopting instrument. In order to assist NFPA in following the uses made of its documents, adopting authorities are requested to notify the NFPA (Attention: Secretary, Standards Council) in writing of such use. For technical assistance and questions concerning adoption of NFPA documents, contact NFPA at the address below.

For Further Information

All questions or other communications relating to NFPA codes, standards, recommended practices, and guides and all requests for information on NFPA procedures governing its codes and standards development process, including information on the procedures for requesting Formal Interpretations, for proposing Tentative Interim Amendments, and for proposing revisions to NFPA documents during regular revision cycles, should be sent to NFPA headquarters, addressed to the attention of the Secretary, Standards Council, NFPA, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

For more information about NFPA, visit the NFPA website at www.nfpa.org.

--`,,,,,,,-`-`,,`,,`,`,,`---

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS

Not for Resale

Copyright © 2004, National Fire Protection Association, All Rights Reserved

NFPA 405

Standard for the

Recurring Proficiency of Airport Fire Fighters

2004 Edition

This edition of NFPA 405, *Standard for the Recurring Proficiency of Airport Fire Fighters,* was prepared by the Technical Committee on Aircraft Rescue and Fire Fighting and acted on by NFPA at its May Association Technical Meeting held May 23–26, 2004, in Salt Lake City, UT. It was issued by the Standards Council on July 16, 2004, with an effective date of August 5, 2004, and supersedes all previous editions.

This edition of NFPA 405 was approved as an American National Standard on August 5, 2004.

Origin and Development of NFPA 405

In 1994, the Standards Council approved the request of the Technical Committee on Aircraft Rescue and Fire Fighting to develop a new document to address the maintaining of proficiency of aircraft rescue and fire-fighting services at airports. This recommended practice evolved from the U.S. Department of Transportation, Federal Aviation Administration, Federal Aviation Regulations (FAR), Part 139, *Certification and Operations: Land Airports Serving Certain Air Carriers.* In NFPA 405, the Committee had expanded the training curriculum provided in Part 139.319 by providing airport authorities with more specific information with which to develop comprehensive programs in order to maintain proficiency of ARFF services at airports.

The 1999 edition was a recommended practice. The document was changed to a standard for this 2004 edition.

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

Technical Committee on Aircraft Rescue and Fire Fighting

Brian Boucher, *Chair*
Air Canada Pilots Association, NY [L]

Lawrence V. Powers, *Secretary*
Massport Fire-Rescue, MA [L]

Keith W. Bagot, U.S. Federal Aviation Administration, NJ [RT]
Rep. Federal Aviation Administration
Alan Black, Dallas/Fort Worth Airport Board, TX [C]
Rep. Airports Council International-North America
Ralph Colet, John Russo Industrial Inc., CA [M]
Robert L. Darwin, Hughes Associates, Inc., MD [SE]
Ross A. Davidson, U.S. Department of the Navy, CA [C]
Roger Davis, BAA plc, United Kingdom [C]
Christopher Farnaby, United Kingdom Civil Aviation Authority, England [E]
Kenneth R. Gilliam, U.S. Federal Aviation Administration, FL [E]
Rep. Federal Aviation Administration
George F. Hall, U.S. Air Force, FL [C]
Donald E. Hilderbrand, Phoenix Fire Department, AZ [U]
L. M. Krasner, FM Global, MA [I]
Rep. FM Global/FM Research
Paul S. Meyer, Hartsfield Atlanta International Airport, GA [C]
John J. O'Sullivan, British Airways, PLC, England [SE]
Pam L. Phillips, Port Authority of New York & New Jersey, NY [C]
Rep. American Association of Airport Executives
Thomas J. Phillips, Air Line Pilots Association, PA [L]
Rep. Air Line Pilots Association
Danny M. Pierce, Los Angeles World Airports, CA [L]
Rep. International Aviation Fire Protection Association
Lee W. Prazer, Akron Brass Company, OH [M]
Richard M. Radford, Dubai International Airport, United Arab Emirate [U]
Michael D. Reagan, Los Angeles City Fire Department, CA [U]
Gary T. Schott, Omaha Airport Authority, NE [L]
Rep. Aircraft Rescue & Fire Fighting Working Group
John M. Schuster, 3M Company, MN [M]
Terry Seaborn, Oshkosh Truck Corporation, WI [M]
Robert L. Shaub, Emergency One, Inc., FL [M]
William D. Stewart, Maryland Aviation Administration, MD [U]
Rep. International Association of Fire Chiefs
Bernard Valois, Transport Canada Civil Aviation, Canada [E]
Ronald O. Wikander, Lockheed Martin Aeronautics Company, GA [U]
Joseph A. Wright, ARFF Technical Services, Inc., PA [SE]

Alternates

Tony Cash, Air Safety Support International, England [E]
(Alt. to Christopher Farnaby)
Michael P. Crowe, Oshkosh Truck Corporation, WI [M]
(Alt. to Terry Seaborn)
Robert J. Donahue, Massport Fire-Rescue, MA [L]
(Alt. to Lawrence V. Powers)
Eric J. Gogley, U.S. Department of the Navy, CA [C]
(Alt. to Ross A. Davidson)
Robert G. Lindstrom, Pro-Tec Fire Services Ltd., OK [L]
(Alt. to Gary T. Schott)
Dawn E. Lucini, Airports Council International-North America, DC [C]
(Alt. to Alan Black)
Thomas V. Mai, U.S. Federal Aviation Administration, DC [E]
(Alt. to Kenneth R. Gilliam)
Madhu Manikkam, Emergency One, Inc., FL [M]
(Alt. to Robert L. Shaub)
Harold D. Miller, Atlanta Fire Department, GA [C]
(Alt. to Paul S. Meyer)
Gaétan Morinville, Canadian Forces Fire Marshal 4, Canada [C]
(Voting Alt. to Canadian Forces)
James F. O'Regan, O'Regan Consulting/JRI, Inc., MA [M]
(Alt. to Ralph Colet)
William Savage, Gloucestershire, United Kingdom [L]
(Alt. to Danny M. Pierce)
Joseph L. Scheffey, Hughes Associates, Inc., MD [SE]
(Alt. to Robert L. Darwin)
Bernard Stone, BAA plc, United Kingdom [C]
(Alt. to Roger Davis)
Craig A. Williams, American Association of Airport Executives, VA [L]
(Alt. to Pam L. Phillips)

Nonvoting

B. Victor Hewes, Airport Safety Services, GA [SE]
Thomas J. Lett, Albuquerque Fire & Safety Associates, NM [SE]
Francois Villard, Fire Safety Security Crisis Management Training, Switzerland [SE]
(Member Emeritus)

Mark T. Conroy, NFPA Staff Liaison

This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of the document.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents on aircraft rescue and fire-fighting services and equipment, for procedures for handling aircraft fire emergencies, and for specialized vehicles used to perform these functions at airports, with particular emphasis on saving lives and reducing injuries coincident with aircraft fires following impact or aircraft ground fires. This Committee also shall have responsibility for documents on aircraft hand fire extinguishers and accident prevention and the saving of lives in future aircraft accidents involving fire.

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

Contents

Chapter 1 Administration **405–** 4
1.1 Scope **405–** 4
1.2 Purpose **405–** 4
1.3 Application **405–** 4

Chapter 2 Referenced Publications (Reserved) **405–** 4
Chapter 3 Definitions **405–** 4
3.1 General **405–** 4
3.2 NFPA Official Definitions **405–** 4
3.3 General Definitions **405–** 4

Chapter 4 General Requirements **405–** 5
4.1 General **405–** 5
4.2 Evaluation Criteria **405–** 5
4.3 Record Keeping **405–** 5

Chapter 5 Airport Familiarization **405–** 5
5.1 Scope **405–** 5
5.2 Competency **405–** 5
5.3 Maps **405–** 5
5.4 Scenarios **405–** 5
5.5 Airport Markings **405–** 5
5.6 Lighting **405–** 5
5.7 Signage **405–** 5
5.8 Airport Traffic **405–** 5

Chapter 6 Aircraft Familiarization **405–** 5
6.1 Scope **405–** 5
6.2 Competency **405–** 5
6.3 Criteria **405–** 5

Chapter 7 ARFF Personnel Safety **405–** 6
7.1 Scope **405–** 6
7.2 Competency **405–** 6
7.3 Criteria **405–** 6

Chapter 8 Personal Protective Equipment **405–** 6
8.1 Scope **405–** 6
8.2 Competency **405–** 6
8.3 Protective Clothing and Equipment **405–** 6
8.4 Breathing Apparatus **405–** 6

Chapter 9 Aircraft Cargo Hazards **405–** 6
9.1 Scope **405–** 6
9.2 Competency **405–** 6
9.3 Criteria **405–** 6
9.4 Decontamination **405–** 7

Chapter 10 Emergency Communications Systems ... **405–** 7
10.1 Scope **405–** 7
10.2 Competency **405–** 7
10.3 Criteria **405–** 7

Chapter 11 ARFF Vehicles and Equipment **405–** 7
11.1 Scope **405–** 7
11.2 Tools and Equipment **405–** 7
11.3 Vehicle Inspection and Maintenance **405–** 7
11.4 Operation of Equipment and Devices **405–** 7
11.5 ARFF Vehicle Operation **405–** 7

Chapter 12 Extinguishing Agents **405–** 8
12.1 Scope **405–** 8
12.2 Selection and Application **405–** 8
12.3 Descriptions of Effects **405–** 8

Chapter 13 Emergency Aircraft Evacuation Assistance **405–** 8
13.1 Scope **405–** 8
13.2 Criteria **405–** 8

Chapter 14 Rescue and Fire-Fighting Operations ... **405–** 8
14.1 Scope **405–** 8
14.2 Criteria **405–** 8
14.3 Emergency Alerts **405–** 8
14.4 Vehicle Routes **405–** 8
14.5 Size-Up Procedures **405–** 8
14.6 Factors Affecting Fire Attack **405–** 8
14.7 Response Considerations **405–** 8
14.8 Tactical Considerations **405–** 8
14.9 ARFF Vehicle Positioning **405–** 8
14.10 Agent Application **405–** 8
14.11 Ventilation Considerations **405–** 8
14.12 Structural Apparatus **405–** 8
14.13 Extinguishing Agent Resupply **405–** 9
14.14 Fire Department Supply and Resupply ... **405–** 9
14.15 Post-Fire Considerations **405–** 9

Chapter 15 Live Fire Fighting **405–** 9
15.1 Scope **405–** 9
15.2 Competency **405–** 9
15.3 Criteria **405–** 9

Chapter 16 Airport Emergency Plan **405–** 9
16.1 General **405–** 9
16.2 Fire Department Response **405–** 9
16.3 Incident Command **405–** 9

Chapter 17 Emergency Medical Services (EMS) ... **405–** 9
17.1 Scope **405–** 9
17.2 Competency **405–** 9
17.3 Criteria **405–** 9

Chapter 18 Administration and Standards **405–**10
18.1 Scope **405–**10
18.2 Criteria **405–**10

Chapter 19 Water Rescue Operations **405–**10
19.1 Scope **405–**10
19.2 Competency **405–**10
19.3 Criteria **405–**10

Annex A Explanatory Material **405–**10
Annex B Informational References **405–**11

Index **405–**12

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

NFPA 405

Standard for the

Recurring Proficiency of Airport Fire Fighters

2004 Edition

IMPORTANT NOTE: This NFPA document is made available for use subject to important notices and legal disclaimers. These notices and disclaimers appear in all publications containing this document and may be found under the heading "Important Notices and Disclaimers Concerning NFPA Documents." They can also be obtained on request from NFPA or viewed at www.nfpa.org/disclaimers.

NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

A reference in brackets [ ] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, the complete title and edition of the source documents for mandatory extracts are given in Chapter 2 and those for nonmandatory extracts are given in Annex B. Editorial changes to extracted material consist of revising references to an appropriate division in this document or the inclusion of the document number with the division number when the reference is to the original document. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Annex B.

Chapter 1 Administration

1.1 Scope. This standard contains the required performance criteria by which an authority having jurisdiction over aircraft rescue and fire fighting (ARFF) maintains proficiency and effective ARFF at airports.

1.2 Purpose. This standard is intended for the use of those charged with maintaining ARFF services at airports and establishes the basis for a recurring training program that focuses on measurable performance criteria.

1.2.1 This standard addresses the development of effective, coordinated aircraft rescue and fire control operations with a minimum exposure to risk for participants and the environment.

1.2.2 Results of evaluations conducted in accordance with the requirements of this standard shall be recorded and maintained by means of a documented management system.

1.2.3 Continuous broad-based training is fundamental to maintaining a proficient ARFF delivery system at airports.

1.2.4 ARFF personnel at airports shall meet approved performance objectives and requirements prior to assignment and thereafter shall receive necessary recurring training that will enable them to consistently meet the requirements of this standard relative to the individual's role and tasks.

1.3 Application.

1.3.1 The provisions of this standard are considered fundamental to maintaining levels of professional competence of ARFF services at airports.

1.3.2 This standard is intended to be adopted as a model for the development of a proficient in-service training program for ARFF personnel at airports.

Chapter 2 Referenced Publications (Reserved)

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 included, common usage of the terms shall apply.

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.

3.2.5 Standard. A document, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and which is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions shall be located in an appendix or annex, footnote, or fine-print note and are not to be considered a part of the requirements of a standard.

3.3 General Definitions.

3.3.1 Aircraft Accident. An occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and until all such persons have disembarked and in which any person suffers death or serious injury or in which the aircraft receives substantial damage. [**403:**3.3]

3.3.2* Aircraft Incident. An occurrence, other than an accident, associated with the operation of an aircraft, that affects or could affect continued safe operation if not corrected. [**402:**3.3]

3.3.3 ARFF Personnel. Personnel under the operational jurisdiction of the chief of the airport fire department assigned to aircraft rescue and fire fighting.

3.3.4 Critical Rescue and Fire-Fighting Access Area. The rectangular area that surrounds a runway within which aircraft movements can be expected to occur on airports and whose width extends 150 m (500 ft) from each side of the runway centerline and whose length is 1000 m (3300 ft) beyond each runway threshold. [**403:**3.3]

3.3.5 Knowledge. What the individual must know or understand in order to carry out a role and subsequent tasks to the standard required.

3.3.6 Size-Up (Risk Assessment). A mental process of evaluating the influencing factors at an incident prior to committing resources to a course of action. [**1670:**3.3]

3.3.7 Skills. Behaviors or actions that require practice in order to be performed satisfactorily. The skills or abilities can be manual, social, interpersonal, or intellectual.

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

Chapter 4 General Requirements

4.1 General.

4.1.1 Each evaluation of skills and knowledge required by this standard shall be conducted at regular intervals of at least every 18 months by a designated qualified evaluator(s) appointed by the authority having jurisdiction.

4.1.2 All evaluations shall be performed in a competent manner, and each objective shall be met in its entirety.

4.2* Evaluation Criteria. The authority having jurisdiction shall establish the evaluation criteria for each objective or task to be evaluated in accordance with Chapter 4 through Chapter 19 to ensure competency for each person assigned ARFF duties.

4.2.1 Where actual operation is not feasible, evaluation of skills and knowledge shall be carried out by simulations. Those simulated exercises shall be structured to involve the organization and achievement of specific task(s), to include team coordination, explanations, and illustrations that seek to reproduce a real life situation.

4.2.2 Whenever any of the following terms — *rules*, *regulations*, *procedures*, *supplies*, *apparatus*, and *equipment* — are referred to in this standard, it shall be implied that they are the terms of the authority having jurisdiction.

4.3 Record Keeping. Records sections, including "general" individual training records, shall be maintained for each ARFF employee and shall include the following:

(1) Name of the individual
(2) Date of training
(3) Subject covered and course methodology
(4) Climatic conditions
(5) Duration of training
(6) Instructor comments
(7) Performance evaluation
(8) Name of instructor
(9) Signature of student

Chapter 5 Airport Familiarization

5.1 Scope. This chapter identifies the knowledge and skills necessary to maintain proficiency in airport familiarization.

5.2 Competency. ARFF personnel shall have a thorough knowledge of their airport and its immediate surrounding area under all operating conditions, which is fundamental in achieving a rapid response by ARFF personnel and equipment to the critical rescue and fire-fighting access area with special emphasis to prevent runway incursions.

5.3 Maps. The ARFF personnel, given a map of the airport and vicinity, shall identify the following features:

(1) All runways, their designations and associated aircraft travel direction, and lengths and widths
(2) Access roads
(3) Taxiways and their designations
(4) Aircraft ramps/parking areas
(5) Frangible gate locations
(6) Instrument landing system (ILS) critical areas (for example, CAT I, CAT II, CAT III, where applicable)
(7) Designated aircraft isolation areas
(8) Controlled access points
(9) Predesignated staging areas
(10) Airport facilities (terminals, hangars, and so forth)
(11) Water supplies
(12) Other specialized equipment for low visibility operations

5.4 Scenarios. Given a simulated incident or accident scenario, a radio, and a destination on the airport, ARFF personnel shall safely perform the following:

(1) Communicate with ground control
(2) Obtain all necessary clearances
(3) Select the shortest and safest response route to arrive at the designated point within specified times required by the authority having jurisdiction
(4) Communicate directly by radio with a flight crew regarding the aircraft emergency situation

5.5 Airport Markings. ARFF personnel, given a diagram of the aircraft movement area, shall identify the following airport markings:

(1) Color of runway markings
(2) Color of taxiway markings
(3) Hold bars (lines) and, where applicable, CAT I, CAT II, CAT III
(4) Displaced thresholds
(5) Aiming point/landing zone bars
(6) Apron ground markings
(7) Other painted surface markings

5.6 Lighting. ARFF personnel shall identify either the color code system or location, or both, for the following:

(1) Runway centerline and edge lighting
(2) Taxiway centerline and edge lighting
(3) Runway threshold lights
(4) Runway departure end lights
(5) Obstruction lighting
(6) Visual slope indicator lights
(7) Runway guard lights
(8) Stop bars

5.7 Signage. ARFF personnel shall identify the signage system for the airport.

5.8 Airport Traffic. Given a map of the airport, ARFF personnel shall identify all motor vehicle traffic routes and the traffic flow system of the airport, including vehicle parking and storage areas.

Chapter 6 Aircraft Familiarization

6.1 Scope. This chapter identifies the knowledge and skills necessary to maintain proficiency in aircraft familiarization.

6.2 Competency. ARFF personnel shall have a thorough knowledge of all types of aircraft utilizing the airport.

6.3* Criteria. ARFF personnel shall continuously demonstrate proficiency in the following behaviors pertinent to the types of aircraft regularly operating at the airport:

(1) Identify the various types and models of aircraft including the approximate number of passengers each is designed to carry
(2) Identify the categories of aircraft propulsion systems and their associated hazards
(3) Identify major aircraft structural components using the correct terms and nomenclature

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

(4) Describe materials used in aircraft construction and their effects on fire and rescue operations
(5) Demonstrate the proper use of an aircraft familiarization chart by identifying and describing the following:
  (a) Location of normal entry doors, emergency exits, and evacuation slides
  (b) Fuel tanks
  (c) Passenger and flight crew compartments
  (d) Oil tanks
  (e) Hydraulic reservoirs
  (f) Oxygen cylinders
  (g) Batteries
  (h) Fuselage break-in points
  (i) Emergency engine shutdown procedures
  (j) External/internal auxiliary power unit (APU) shutoff and fire extinguishment systems (where applicable)
  (k) Parts of aircraft structure containing man-made mineral fibers (composite material)
(6) Demonstrate the ability to properly open and operate emergency exits
(7) Demonstrate the ability to locate and operate various compartment and access doors
(8) Locate, identify, and explain the procedures for the following systems and components where applicable:
  (a) Various onboard fire protection warning and extinguishing systems
  (b) APU shutdown controls
  (c) Flight data recorder and cockpit voice recorder
  (d) Brake and wheel systems
  (e) Aircraft emergency engine shutdown controls
(9) Identify and describe particular hazards unique to particular aircraft

Chapter 7 ARFF Personnel Safety

7.1 Scope. This chapter identifies the knowledge and skills necessary to ensure ARFF personnel safety.

7.2 Competency. To reduce the risk associated with most ARFF operations, ARFF personnel shall have in-depth knowledge of the exposure to the hazards associated with their occupation through training and periodic testing of their knowledge and skills.

7.3 Criteria. ARFF personnel shall possess the knowledge to articulate accident prevention and safe work practices in the following areas:

(1) Most frequent types of fireground accidents
(2) Cause of injuries in specific incidents
(3) Proper lifting techniques
(4) How to avoid falls and tripping accidents
(5) Inherent dangers associated with striking stationary or moving objects
(6) Hazards associated with horseplay
(7) Injuries occurring from overexertion or other physiological factors
(8) Proper donning and wearing of protective clothing and equipment
(9) Safe mounting, dismounting, and riding on apparatus
(10) Basic driving safety
(11) Critical stress management
(12) Water safety (where located near water)
(13) Safe use of tools and equipment

Chapter 8 Personal Protective Equipment

8.1 Scope. This chapter identifies the knowledge and skills necessary to identify, maintain, and utilize personal protective equipment.

8.2 Competency. ARFF personnel shall have an intimate knowledge of personal protective equipment on which their lives and those of others depend.

8.3 Protective Clothing and Equipment. ARFF personnel shall be able to articulate the proper wearing, maintenance, and purpose of the following protective clothing and equipment:

(1) Boots
(2) Gloves
(3) Turnout coat
(4) Turnout pants
(5) Helmet
(6) Eye protection
(7) Self-contained breathing apparatus (SCBA)
(8) Protective hoods
(9) Specialized clothing
(10) Hearing protection

8.4 Breathing Apparatus. ARFF personnel shall be able to demonstrate and articulate the various systems and their purpose relative to their assigned breathing apparatus including the following:

(1) Physiology of respiration including the following:
  (a) Respiratory system
  (b) Need for respiratory protection
  (c) Threshold limit values
  (d) Short-term exposure limits
(2) Types of breathing apparatus assigned
(3) Breathing apparatus procedures including the following:
  (a) Donning and doffing procedures
  (b) Safety precautions and emergency procedures
  (c) Decontamination/cleaning methods and procedures
  (d) Routine testing and maintenance
  (e) Care and maintenance of air cylinders
  (f) Breathing apparatus control procedures
  (g) Cylinder removal and replacement
  (h) Cylinder recharging

Chapter 9 Aircraft Cargo Hazards

9.1* Scope. This chapter identifies the knowledge, skills, and procedures necessary to identify and safely mitigate cargo hazards during emergencies.

9.2 Competency. ARFF personnel shall demonstrate familiarity with the level of personal protection required for dealing with specific incidents.

9.3 Criteria. ARFF personnel shall demonstrate the following:

(1) Comprehensive knowledge of the airport's dangerous cargo response plan
(2) Use of available reference materials to identify dangerous goods and determine the appropriate action to safely and effectively manage the incident

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

(3) Procedures for the identification, risk assessment, isolation, rescue, and evacuation requirements for a given dangerous goods incident
(4) Correct utilization of personal protective equipment and monitoring devices as they relate to the airport's dangerous goods response plan

9.4 Decontamination. ARFF personnel shall, for a given dangerous goods incident, identify the decontamination procedures required for personnel, equipment, and the incident site.

Chapter 10 Emergency Communications Systems

10.1 Scope. This chapter identifies the knowledge and skills necessary to identify and operate airport communications systems available for fire department use.

10.2 Competency. ARFF personnel shall demonstrate the knowledge and operational skills pertaining to the use and required maintenance of communications systems used by the airport fire department.

10.3 Criteria. ARFF personnel shall maintain a proficiency and shall demonstrate the following on a prescribed periodic basis:

(1) Thorough knowledge of and ability to operate all primary and alternate airport emergency communication systems that connect the fire department with the following:
  (a) Control tower or flight service station
  (b) Airport administrative offices
  (c) Airlines
  (d) Fixed-base operators
  (e) Mutual aid agencies
  (f) Airport service vehicles
  (g) Airport fire service vehicles
(2) Operating knowledge of the fire department's standby power source (or alternate communications system), its testing sequence, procedure, test recording, and routine maintenance
(3) Working knowledge of the function of all emergency and backup alarm systems and their devices and the ability to reinstate all systems that have been activated
(4) Awareness of all possible ways of reporting emergencies and the steps required to ensure that complete notification occurs
(5) Thorough knowledge and application of the international phonetic alphabet and standard airport communications terminology
(6) Complete knowledge of and ability to operate all fire department, ground control, mutual aid, and airport radio frequencies using prescribed procedures, discipline, and protocol
(7) Ability to initiate and operate all communications features contained in the fire department alarm room, its emergency vehicles, and any vehicle dedicated for use as a communications or command unit
(8) Ability to communicate with flight deck personnel by means of an aircraft's interphone system, by control tower relay, by direct radio contact, or by use of standard international ground-to-aircraft hand signals
(9) Location of the aircraft interphone system jack located on each aircraft type using the airport
(10) Ability to locate, for purposes of emergency use, vital telephone numbers so that calls can be directed to individuals and agencies as required
(11) Working knowledge of alternate means of communications; the location and use of special equipment such as cellular and hard-wired field phones, power megaphones, and flashlights for hand signaling; and the ability to interpret light signals from the control tower

Chapter 11 ARFF Vehicles and Equipment

11.1 Scope. This chapter identifies the knowledge and skills to be demonstrated by designated ARFF personnel who are required to operate ARFF vehicles and special equipment under all operating conditions.

11.2 Tools and Equipment. ARFF personnel shall be able to describe the individual tools and equipment on each ARFF vehicle on the airport.

11.2.1 The description shall include the equipment's designed use, required maintenance, storage procedures, and a demonstration of its use.

11.2.2 ARFF personnel shall also be able to describe with complete accuracy the equipment storage location on each vehicle.

11.3 Vehicle Inspection and Maintenance. ARFF personnel shall be able to demonstrate their knowledge and skills relative to routine inspection and maintenance of vehicles in accordance with fire department policy and manufacturers' specifications and maintenance manuals.

11.4 Operation of Equipment and Devices. ARFF personnel shall be able to demonstrate that they have sufficient knowledge and skills to efficiently and safely operate the following systems of assigned emergency vehicles:

(1) Communications equipment
(2) Pump operation
(3) Proportioning system
(4) Turret(s)
(5) Vehicle positioning and maneuvering
(6) Elevated devices (where provided)
(7) Skin penetrating tools (where provided)
(8) Various nozzles (types and applications)
(9) Lighting systems (for accident site)
(10) Driver enhanced vision system (DEVS)
(11) Rescue tools (forcible entry, cutting, lifting, and so forth)
(12) Ladder evolutions
(13) Ventilation equipment
(14) Complementary agent system
(15) Systems for replenishment of fire-fighting agent
(16) Back-up systems for the production and application of fire-fighting agent (where applicable)

11.5 ARFF Vehicle Operation. Designated ARFF personnel shall have sufficient knowledge and skills to efficiently and safely operate the assigned vehicle(s), in the following manner:

(1) With its agent tanks fully loaded, semiloaded, and unloaded
(2) In all climatic conditions experienced at the airport
(3) Within safe limits while negotiating high-speed tight turns and high-speed braking
(4) In an environment that has no signage
(5) In various conditions of lighting
(6) In off-road conditions
(7) While discharging fire-fighting agent on the move or at a static position through the turret(s) and under truck nozzles as applicable

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

Chapter 12 Extinguishing Agents

12.1 Scope. This chapter identifies the knowledge and skills required for ARFF personnel relative to the proper selection and application of extinguishing agents to be used on fires involving aircraft.

12.2 Selection and Application. Given all the extinguishing agents used at the airport, ARFF personnel shall be able to describe the choice and application for the following types of fires:

(1) Aviation gasoline (AvGas)
(2) Jet fuel
(3) Interior aircraft combustibles
(4) Magnesium
(5) Electrically energized
(6) Composite materials
(7) Engine
(8) Cargo
(9) Wheel fires
(10) Avionics bay
(11) Auxiliary power unit (APU)

12.3 Descriptions of Effects. Given all the extinguishing agents used at the airport, ARFF personnel shall be able to describe the effects of agent application when the following conditions exist:

(1) Wind
(2) Rain
(3) Freezing weather
(4) Use of more than one agent (compatibility)
(5) Fuel-soaked sod and flowing fuel or pressurized fuel

Chapter 13 Emergency Aircraft Evacuation Assistance

13.1 Scope. This chapter identifies the comprehensive knowledge and skills necessary in emergency aircraft evacuation procedures for all types of aircraft using the airport.

13.2 Criteria. ARFF personnel shall be able to demonstrate a comprehensive knowledge of the following emergency evacuation systems and devices:

(1) Emergency exits
(2) Stairways
(3) Evacuation slides
(4) Military aircraft evacuation and ejection systems and canopy ejection systems

Chapter 14 Rescue and Fire-Fighting Operations

14.1* Scope. This chapter identifies the knowledge and skills necessary during an emergency involving aircraft.

14.2 Criteria. ARFF personnel shall be able to describe how each of the following items could affect an emergency response:

(1) Nature of the emergency
(2) Type of aircraft
(3) Number of passengers and crew
(4) Amount of fuel on board
(5) Location of the accident
(6) Nature and location of cargo
(7) Wind direction and velocity
(8) Weather conditions and terrain
(9) ARFF vehicle status
(10) Time of day or night

14.3 Emergency Alerts. ARFF personnel shall be able to identify the types of emergency alerts that occur on the airport and the actions of the fire department required for each type.

14.4 Vehicle Routes. Given several locations on and off the airport, ARFF personnel shall be able to describe the most direct response routes, alternate routes, and problems or hazards that they could present.

14.5 Size-Up Procedures. Given any accident situation, ARFF personnel shall describe how the correct "size up" (risk assessment) procedures are carried out.

14.6 Factors Affecting Fire Attack. Given a fire situation, ARFF personnel shall describe how the following factors could affect the fire attack:

(1) Wind
(2) Terrain
(3) Wreckage
(4) Survivors
(5) Hazardous areas

14.7 Response Considerations. ARFF personnel shall be able to define the following factors in regard to an aircraft fire and their relationships as exposures:

(1) Survivors
(2) Other aircraft
(3) Structures
(4) Unaffected parts of the involved aircraft

14.8 Tactical Considerations. ARFF personnel shall be able to define and prioritize the following tactical fire suppression categories:

(1) Rescue
(2) Exposure protection
(3) Fire confinement
(4) Interior attack and ventilation
(5) Ventilation
(6) Overhaul
(7) Fire extinguishment

14.9 ARFF Vehicle Positioning. Given a scenario, ARFF personnel shall explain the positioning of ARFF vehicles to assist in a given strategy with respect to the following factors:

(1) Ground slope
(2) Wind direction
(3) Movement of other vehicles
(4) Most effective use of turrets and hand lines

14.10 Agent Application. ARFF personnel shall be able to describe those factors to be considered that affect extinguishing agent application pertinent to water or agent conservation.

14.11 Ventilation Considerations. ARFF personnel shall be able to identify the following ventilation factors as they relate to an aircraft fire:

(1) Backdraft considerations
(2) Flashover considerations
(3) Ventilation locations
(4) Methods of ventilation

14.12 Structural Apparatus. ARFF personnel shall be able to define the structural apparatus expected to respond to the airport on mutual aid assignments and how the vehicles and equipment are most effectively deployed.

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

14.13 Extinguishing Agent Resupply. ARFF personnel shall be able to explain extinguishing agent resupply procedures established by the airport fire department.

14.14 Fire Department Supply and Resupply. ARFF personnel shall be able to identify fire department supply and resupply sources on and adjacent to the airport.

14.15 Post-Fire Considerations. ARFF personnel shall be able to explain post-fire operations policy established by their fire department as they relate to the following:

(1) Biological hazards or hazardous materials considerations
(2) Site security
(3) Site photographs and documentation
(4) Body removal
(5) Movement of wreckage

Chapter 15 Live Fire Fighting

15.1 Scope. This chapter identifies the various types and sizes of fires associated with aircraft accidents.

15.2 Competency. ARFF personnel shall regularly demonstrate, individually and as teams, their ability to safely and effectively control and extinguish fires associated with aircraft accidents.

15.3 Criteria. The ARFF personnel shall meet the job performance requirements defined in 15.3.1 through 15.3.4.

15.3.1 Extinguish a 23.2 m^2 (250 ft^2) aircraft fuel spill fire, given proximity personal protective equipment (PrPPE) and at a minimum a 45 kg (100 lb) dry chemical fire extinguisher, so that the agent is applied using the proper technique and the fire is extinguished in 25 seconds.

(A) Requisite Knowledge. The fire behavior of aircraft fuels in pools and the physical properties and characteristics of aircraft fuel.

(B) Requisite Skills. Operate dry chemical extinguishers equipped with a hose line, including removing and operating hose and applying agent.

15.3.2 Extinguish an aircraft fuel spill fire, given PrPPE, an assignment, an ARFF vehicle hand line flowing a minimum of 359 L/min (95 gpm) of ARFF extinguishing agent, and a fire sized to the ARFF L/min (gpm) flow rate divided by 0.492 (0.13) [L/min/0.492 = 0.304 m^2 (gpm/0.13 = fire square footage)], so that the agent is applied using the proper techniques and the fire is extinguished in 45 seconds.

(A) Requisite Knowledge. The fire behavior of aircraft fuels in pools, physical properties and characteristics of aircraft fuel, and agent application rates and densities.

(B) Requisite Skills. Operate fire streams and apply agent.

15.3.3 Extinguish an aircraft fuel spill fire, given PrPPE, an ARFF vehicle turret, and a fire sized to the ARFF flow rate of 0.492 L/min (0.13 gpm) divided by the square meters (feet) of fire area, so that the agent is applied using the proper technique and the fire is extinguished in 45 seconds.

(A)* Requisite Knowledge. Operation of ARFF vehicle agent delivery systems, the fire behavior of aircraft fuels in pools, physical properties and characteristics of aircraft fuel, and agent application rates and densities.

(B)* Requisite Skills. Apply fire-fighting agents and streams using ARFF vehicle turrets.

15.3.4 Extinguish a three-dimensional aircraft fuel fire, given PrPPE, an assignment, and ARFF vehicle hand line(s) using primary and secondary agents, so that a dual agent attack is used, the agent is applied using the proper technique, the fire is extinguished, and the fuel source is secured.

(A) Requisite Knowledge. The fire behavior of aircraft fuels in three-dimensional and atomized states, physical properties and characteristics of aircraft fuel, agent application rates and densities, and methods of controlling fuel sources.

(B) Requisite Skills. Operate fire streams, apply agents, and secure fuel sources.

Chapter 16 Airport Emergency Plan

16.1* General. ARFF personnel shall understand their duties and responsibilities as defined in the airport emergency plan.

16.2 Fire Department Response. ARFF personnel shall be able to identify and describe each type of emergency listed in the plan, including alert procedures, that requires a response of the fire department.

16.3 Incident Command. For each emergency involving the fire department, ARFF personnel shall provide descriptions or identify the following:

(1) Describe the chain of command and command authority at incidents both on and off the airport
(2) Identify the personnel associated with each responsibility in the incident management system
(3) Describe the procedures for the change of command during any phase of the emergency
(4) Identify and describe other agencies involved, including each individual role, responsibility, and authority
(5) Describe in general various ARFF personnel duties and responsibilities under the plan
(6) Describe the incident management structure in use at the airport and how this interfaces with external mutual aid organizations
(7) Describe offensive and defensive fire-fighting operations

Chapter 17 Emergency Medical Services (EMS)

17.1 Scope. This chapter identifies the critical knowledge and skills that ARFF personnel shall have in order to provide basic emergency medical service (EMS) at the airport.

17.2 Competency. ARFF personnel shall have the knowledge and skills necessary to operate in an emergency environment until additional medical resources become available.

17.3 Criteria. ARFF personnel shall be able to perform the following tasks:

(1) Define the accepted method of infection control and universal blood and body fluid precautions as prescribed for public safety workers
(2) Demonstrate methods of decontamination, disinfection, and disposal of personal protective equipment (PPE) that has become contaminated
(3) Explain or demonstrate the accepted procedures for single-rescuer and two-rescuer cardiopulmonary resuscitation (CPR), including adult, child, and infant procedures

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

(4) Demonstrate management of an obstructed airway for a conscious and an unconscious adult, child, and infant
(5) Demonstrate the use of a resuscitation mask in the performance of single-rescuer and two-rescuer CPR
(6) Demonstrate a primary survey for life-threatening injuries
(7) Identify three types of external bleeding and the characteristics of each
(8) Demonstrate three approved methods to control external bleeding
(9) According to severity, identify characteristics and demonstrate treatment of thermal and chemical burns
(10) Describe and demonstrate the techniques for managing the following:
  (a) Head injuries
  (b) Chest injuries
  (c) Fractures
  (d) Spinal injuries
(11) Describe the symptoms and demonstrate emergency treatment of the following:
  (a) Shock
  (b) Fainting
  (c) Allergies
  (d) Convulsions
  (e) Heart attack
  (f) Stroke
(12) Identify the symptoms and demonstrate emergency treatment for the following:
  (a) Ingested poisons
  (b) Drug overdose
(13) Identify the method of contacting the poison control center that serves the airport
(14) Demonstrate knowledge and skill in performing the Heimlich maneuver
(15) Demonstrate the correct method of splinting
(16) Demonstrate precautions and procedures for childbirth and care of the newborn
(17) Demonstrate recognition of common medical conditions (for example, diabetes, pacemaker) that affect medical treatment
(18) Demonstrate approved measures for handling emotionally disturbed persons
(19) Demonstrate techniques for moving the injured
(20) Demonstrate an understanding of the concept of medical triage
(21) Demonstrate an understanding of the treatment of fatalities
(22) Be familiar with the parameters of a simple triage and rapid transport system

Chapter 18 Administration and Standards

18.1 Scope. This chapter identifies general administrative requirements and responsibilities.

18.2 Criteria. ARFF personnel shall demonstrate a comprehensive knowledge of the following:

(1) Airport and fire department standard operating procedures
(2) Local instructions, bylaws, and regulations
(3) Individual responsibilities as they relate to the maintenance and operational effectiveness of ARFF
(4) Record-keeping requirements, including personnel records related to professional competency
(5) Organizational structure
(6) Occupational health and safety regulations
(7) Emergency planning, including personnel roles and responsibilities structured within the plan

Chapter 19 Water Rescue Operations

19.1* Scope. This chapter identifies the knowledge and skills required by ARFF personnel in maintaining levels of competency required in water rescue operations.

19.2 Competency. Because saving lives is the first priority in aircraft rescue and fire fighting, ARFF personnel shall possess the comprehensive knowledge of water safety and shall be highly skilled in water rescue operations for all airports with the need for potential water rescue operations.

19.3 Criteria. ARFF personnel shall be able to demonstrate the following:

(1) Practical boat handling, including maneuvering in confined water, high-speed maneuvering, steering a compass course and taking rough bearings, berthing and unberthing, coming to and weighing anchor, and making fast to and leaving a buoy.
(2) Sound understanding of chartwork, including the meaning of common chart symbols; the use of tidal diamonds; position-fixing course correction allowing for currents and leeway; and dangers to navigation, including rules and regulations for collision prevention.
(3) Comprehensive local knowledge of signals and regulations, local marks, buoyage lights, leading lights and marks, dangers to navigation, minimum and maximum depths over banks, obstructions, currents, and abnormal tidal conditions. A general knowledge of the times and heights of tides and safe landing places in differing weather conditions together with safe compass courses in and out of local harbors is also required.
(4) Recovery of an injured or incapacitated person from the water.
(5) Towing astern and alongside, righting capsized dinghies, working with helicopters, pacing alongside under way, and recognizing search patterns and techniques.
(6) Sound understanding of distress signals, including the regulations for preventing collision.
(7) Signs of approaching bad weather.
(8) Effects of craft stability, freeboard, and trim, together with the loading and discharging of occupants.
(9) Sound understanding of the care and maintenance of rescue craft, including engines, hull, and electrical system, together with day-to-day routine inspections.
(10) Day-to-day inspections of life-saving equipment and devices, together with associated protective clothing.

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.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 the acceptability of installations, procedures, equipment, or materials, the authority having

--`,,,,,,-`-`,,`,,`,`,,`---

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 Authority Having Jurisdiction (AHJ). The phrase "authority having jurisdiction," or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A.3.3.2 Aircraft Incident. An incident does not result in serious injury to persons or substantial damage to aircraft.

A.4.2 Each authority having jurisdiction should establish an ongoing program to evaluate personnel assigned ARFF duties. All ARFF personnel should be evaluated on each objective and task that is applicable to the ARFF operation at their airports as recommended under the provisions of this standard. The pass/fail criteria for performance task-based competencies and minimum test scores on knowledge-based objectives will be established by the authority having jurisdiction based on the operational functions required. In some cases the authority having jurisdiction might establish a minimum requirement of 100 percent for some knowledge-based areas (such as airport familiarization) and might establish a minimum passing score of 75 percent for other knowledge-based areas (based on the local requirements and needs).

A.6.3 Every effort should be made to gain access to all types of aircraft that normally operate at the airport.

A.9.1 The term *mitigate* as it is used in this context means to lessen in severity, that is, emergency response personnel are expected to perform duties, as they relate to aircraft cargo hazards, only to the extent to which they are trained, equipped, and qualified. Utilizing an outside response or professional firm to perform activities beyond the capabilities of the on-airport response might be necessary.

A.14.1 Rescue and fire-fighting operations involve a multitude of tasks, many of which occur simultaneously. All of these tasks need to be considered in "sizing up" an emergency.

A.15.3.3(A) For burn area structures and agent discharge rates, see FAA Advisory Circular 150/5220/17A.

A.15.3.3(B) See A.15.3.3(A).

A.16.1 ARFF personnel are key members of a team organized to deal with airport emergencies.

A.19.1 Personnel who can be called upon to effect rescue from an aircraft that has crashed and/or ditched in water have to have a sound understanding of seamanship and water safety if the rescue of the aircraft's occupants is to succeed.

Annex B Informational References

B.1 Referenced Publications. The following documents or portions thereof are referenced within this standard for informational purposes only and are thus not part of the requirements of this document unless also listed in Chapter 2.

B.1.1 NFPA Publications. (Reserved)

B.1.2 Other Publications.

B.1.2.1 Federal Aviation Administration Publication. Department of Transportation, Distribution Unit, Washington, DC 20590.

FAA Advisory Circular 150/5220/17A, 1998.

B.2 Informational References. (Reserved)

B.3 References for Extracts. The following documents are listed here to provide reference information, including title and edition, for extracts given throughout the nonmandatory sections of this standard as indicated by a reference in brackets [ ] following a section or paragraph. These documents are not a part of the requirements of this document unless also listed in Chapter 2 for other reasons.

NFPA 402, *Guide for Aircraft Rescue and Fire Fighting Operations*, 2002 edition.

NFPA 403, *Standard for Aircraft Rescue and Fire-Fighting Services at Airports*, 2003 edition.

NFPA 1670, *Standard on Operations and Training for Technical Search and Rescue Incidents*, 2004 edition.

--`,,,,,,-`-`,,`,,`,`,,`---

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

Index

© 2004 National Fire Protection Association. All Rights Reserved.

The copyright in this index is separate and distinct from the copyright in the document that it indexes. The licensing provisions set forth for the document are not applicable to this index. This index may not be reproduced in whole or in part by any means without the express written permission of NFPA.

-A-

Accidents
Aircraft ..... *see* Aircraft
ARFF personnel 7.3
Administrative requirements and responsibilities ..... Chap. 18
Aircraft
Accident
Definition 3.3.1
Location of ..... 14.2(5)
Scenario 5.4
Cargo hazards ..... Chap. 9
Communication with ..... 10.3(8)
Evacuation assistance, emergency ..... Chap. 13
Familiarization ..... Chap. 6
Fires, extinguishment of ..... Chap. 12, Chap. 15
Fuel ..... *see* Fuel
Incident
Definition 3.3.2, A.3.3.2
Injuries in ..... 7.3(2)
Scenario 5.4
Interior combustibles ..... 12.2(3)
Aircraft rescue and fire fighting (ARFF) personnel
Competency ..... *see* Competency
Definition 3.3.3
Evaluation criteria ..... *see* Evaluation criteria
Safety of ..... Chap. 7
Aircraft rescue and fire fighting (ARFF) vehicles ..... Chap. 11
Equipment ..... 10.3(1)(g), 11.2, 11.4
Inspection and maintenance 11.3
Operation 11.5
Positioning 14.9
Routes for ..... 5.4(3), 14.4
Tools 11.2
Airport
Emergency plan ..... Chap. 16, 18.2(7)
Familiarization ..... Chap. 5
Markings 5.5
Traffic 5.8
Application of standard 1.3
Approved (definition) 3.2.1, A.3.2.1
ARFF personnel (definition) 3.3.3
Authority having jurisdiction (definition) 3.2.2, A.3.2.2

-B-

Biological hazards ..... 14.15(1)
Body removal ..... 14.15(4)
Breathing apparatus 8.4

-C-

Cargo hazards, aircraft ..... Chap. 9
Clothing, protective 8.3
Communications ..... *see* Emergency communication systems
Competency
Aircraft cargo hazards 9.2
Aircraft familiarization 6.2
Airport familiarization 5.2
Emergency communication systems 10.2
Emergency medical service 17.2
Live fire fighting 15.2
Personal protective equipment 8.2
Safety, personnel 7.2
Water rescue operations 19.2
Critical rescue and fire-fighting access area (definition) 3.3.4

-D-

Decontamination ..... 9.4, 17.3(2)
Definitions ..... Chap. 3
Documentation ..... *see* Record keeping

-E-

Electrical fires, extinguishment of ..... 12.2(5)
Emergency aircraft evacuation assistance ..... Chap. 13
Emergency alerts 14.3
Emergency communications systems ..... 5.4(1), 5.4(4), Chap. 10
Aircraft, communication with ..... 10.3(8)
ARFF vehicles ..... 10.3(1)(g), 11.4(1)
Emergency medical services (EMS) ..... Chap. 17
Emergency plan, airport ..... Chap. 16, 18.2(7)
Engine fires, extinguishment of ..... 12.2(7)
Equipment, ARFF ..... 5.3(12), 7.3(13), 8.3, 11.2
Evacuation assistance, emergency aircraft ..... Chap. 13
Evaluation criteria 4.2, A.4.2
Administration and standards 18.2
Aircraft cargo hazards 9.3
Aircraft familiarization 6.3, A.6.3
ARFF personnel safety 7.3
Emergency aircraft evacuation assistance 13.2
Emergency communication systems 10.3
Emergency medical services 17.3
Live fire fighting ..... 15.3, A.15.3.3(A)
Rescue and fire-fighting operations 14.2
Water rescue operations 19.3
Evaluators, qualified 4.1
Exposure protection ..... 14.7, 14.8(2)
Extinguishing agents ... 11.4(14) to (16), 11.5(1), 11.5(7), Chap. 12
Application ..... 12.2, 14.10, 15.3, A.15.3.3(A)
Descriptions of effects 12.3
Resupply procedures 14.13
Selection 12.2

-F-

Fire attack, factors affecting 14.6
Fire confinement ..... 14.8(3)
Fire department
Response 16.2
Supply and resupply 14.14
Fire extinguishment ..... 14.8(7), Chap. 15
Fire-fighting operations ..... Chap. 14
Fuel
Amount on board ..... 14.2(4)
Fires, extinguishment of ..... 12.2(1), 12.2(2), 15.3, A.15.3.3(A)
Flowing fuel or pressurized fuel ..... 12.3(5)
Fuel-soaked sod ..... 12.3(5)

-H-

Hazardous areas, effect on fire attack of ..... 14.6(5)
Hazardous materials ..... 14.15(1)
Hazards, aircraft cargo ..... Chap. 9

-I-

Incident command 16.3
Interior attack ..... 14.8(4)

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

-K-

Knowledge
Definition 3.3.5
Live fire fighting ..... 15.3.1(A), 15.3.2(A), 15.3.3(A), 15.3.4(A), A.15.3.3(A)

-L-

Lighting 5.6
Live fire fighting ..... Chap. 15

-M-

Maintenance ..... 11.3, 18.2(3)
Maps 5.3
Markings, airport 5.5

-O-

Other aircraft, exposure of ..... 14.7(2)
Overhaul ..... 14.8(6)

-P-

Personal protective equipment ..... Chap. 8, 17.3(2)
Photographs, site ..... 14.15(3)
Post-fire considerations 14.15
Protective clothing 8.3
Purpose of standard 1.2

-R-

Record keeping ..... 4.3, 14.15(3), 18.2(4)
References ..... Annex B
Rescue operations ..... Chap. 14
Response route ..... 5.4(3), 14.4
Resupply procedures and sources 14.13, 14.14

-S-

Safety, ARFF personnel ..... Chap. 7
Scenarios 5.4
Scope of standard 1.1
Self-contained breathing apparatus (SCBA) ..... 8.3(7), 8.4
Shall (definition) 3.2.3
Should (definition) 3.2.4
Signage 5.7
Site photographs and documentation ..... 14.15(3)
Site security ..... 14.15(2)
Size-up (risk assessment) 14.5
Definition 3.3.6
Skills
Definition 3.3.7
Live fire fighting ..... 15.3.1(B), 15.3.2(B), 15.3.3(B), 15.3.4(B), A.15.3.3(B)
Standard (definition) 3.2.5
Standard operating procedures ..... 18.2(1)
Structural apparatus 14.12
Structures, exposure of ..... 14.7(3)
Survivors ..... 14.6(4), 14.7(1)

-T-

Tactical considerations 14.8
Terrain, effect of ..... 14.2(8), 14.6(2)
Three-dimensional fire, extinguishment of 15.3.4
Tools, ARFF 11.2
Traffic, airport 5.8

-V-

Vehicles, ARFF 11.3, 11.5
Ventilation ..... 14.8(4), 14.8(5), 14.11

-W-

Water rescue operations ..... Chap. 19
Weather, effect of ..... 11.5(2), 12.3(1) to (3), 14.2(7), 14.2(8), 14.6(1), 14.9(2)
Wheel/brake area fires, extinguishment of ..... 12.2(9)
Wind, effect of ..... 12.3(1), 14.2(7), 14.6(1), 14.9(2)
Wreckage
Fire attack, effect on ..... 14.6(3)
Movement of ..... 14.15(5)

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

Sequence of Events Leading to Publication of an NFPA Committee Document

Call goes out for proposals to amend existing document or for recommendations on new document.

▼

Committee meets to act on proposals, to develop its own proposals, and to prepare its report.

▼

Committee votes on proposals by letter ballot. If two-thirds approve, report goes forward. Lacking two-thirds approval, report returns to committee.

▼

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

▼

Committee meets to act on each public comment received.

▼

Committee votes on comments by letter ballot. If two-thirds approve, supplementary report goes forward. Lacking two-thirds approval, supplementary report returns to committee.

▼

Supplementary report — *Report on Comments* (ROC) — is published for public review.

▼

NFPA membership meets (Annual or Fall Meeting) and acts on committee report (ROP or ROC).

▼

Committee votes on any amendments to report approved at NFPA Annual or Fall Meeting.

▼

Appeals to Standards Council on Association action must be filed within 20 days of the NFPA Annual or Fall Meeting.

▼

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

Committee Membership Classifications

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

M *Manufacturer:* A representative of a maker or marketer of a product, assembly, or system, or portion thereof, that is affected by the standard.

U *User:* A representative of an entity that is subject to the provisions of the standard or that voluntarily uses the standard.

I/M *Installer/Maintainer:* A representative of an entity that is in the business of installing or maintaining a product, assembly, or system affected by the standard.

L *Labor:* A labor representative or employee concerned with safety in the workplace.

R/T *Applied Research/Testing Laboratory:* A representative of an independent testing laboratory or independent applied research organization that promulgates and/or enforces standards.

E *Enforcing Authority:* A representative of an agency or an organization that promulgates and/or enforces standards.

I *Insurance:* A representative of an insurance company, broker, agent, bureau, or inspection agency.

C *Consumer:* A person who is, or represents, the ultimate purchaser of a product, system, or service affected by the standard, but who is not included in the *User* classification.

SE *Special Expert:* A person not representing any of the previous classifications, but who has a special expertise in the scope of the standard or portion thereof.

NOTES:

1. "Standard" connotes code, standard, recommended practice, or guide.
2. A representative includes an employee.
3. While these classifications will be used by the Standards Council to achieve a balance for Technical Committees, the Standards Council may determine that new classifications of members or unique interests need representation in order to foster the best possible committee deliberations on any project. In this connection, the Standards Council may make such appointments as it seems appropriate in the public interest, such as the classification of "Utilities" in the National Electrical Code Committee.
4. Representatives of subsidiaries of any group are generally considered to have the same classification as the parent organization.

--`,,,,,,-`-`,,`,,`,`,,`---
Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

NFPA Technical Committee Document Proposal Form

Note: All proposals must be received by 5:00 p.m. EST/EDST on the published proposal closing date.

For further information on the standards-making process, please contact 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: _____

Please indicate in which format you wish to receive your ROP/ROC: ☐ **CD ROM** ☐ **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.)

Date 12/18/02 **Name** John B. Smith **Telephone** 617-555-1212
Company _____
Address 9 Seattle St. **City** Seattle **State** WA **Zip** 02255
Please indicate organization represented (if any) Fire Marshals Assn. of North America

1. **a) NFPA Document Title** National Fire Alarm Code
   b) NFPA No. & Edition NFPA 72, 2002 ed. **c) Section/Paragraph** 4.4.7.1.1

2. **Proposal Recommends:** *(check one)* ☐ **new text** ☐ **revised text** ☒ **deleted text**

3. **Proposal.** *(Include proposed new or revised wording, or identification of wording to be deleted.)* Note: Proposed text should be in legislative format, that is, use underscore to denote wording to be inserted (inserted wording) and strike-through to denote wording to be deleted (~~deleted wording~~). Delete exception.

4. **Statement of Problem and Substantiation for Proposal.** Note: State the problem that will be resolved by your recommendation. Give the specific reason for your proposal including copies of tests, research papers, fire experience, etc. If more than 200 words, it may be abstracted for publication. A properly installed and maintained system should be free of ground faults. The occurrence of one or more ground faults should be required to cause a "trouble" signal because it indicates a condition that could contribute to future malfunction of the system. Ground fault protection has been widely available on these systems for years and its cost is negligible. Requiring it on all systems will promote better installations, maintenance and reliability.

5. ☒ **This Proposal is Original Material.** Note: Original material is considered to be the submitter's own idea based on or as a result of his/her own experience, thought, or research and, to the best of his/her knowledge, is not copied from another source.

   ☐ **This Proposal is Not Original Material; Its Source** ***(if known)*** **is as Follows:** _____

Sample

I hereby grant the NFPA all and full rights in copyright to this proposal, and I understand that I acquire no rights in any publication of NFPA in which this proposal in this or another similar or analogous form is used.

Signature ***(Required)*** John B. Smith

PLEASE USE SEPARATE FORM FOR EACH PROPOSAL • NFPA FAX (617) 770-3500

Mail to: Secretary, Standards Council • NFPA • 1 Batterymarch Park • PO Box 9101 • Quincy, MA 02269-9101

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale

NFPA Technical Committee Document Proposal Form

Note: All proposals must be received by 5:00 p.m. EST/EDST on the published proposal closing date.

For further information on the standards-making process, please contact 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: _____

Please indicate in which format you wish to receive your ROP/ROC: ☐ **CD ROM** ☐ **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.)

Date _____ **Name** _____ **Telephone** _____
Company _____
Address _____ **City** _____ **State** _____ **Zip** _____
Please indicate organization represented (if any) _____

1. **a) NFPA Document Title** _____
   b) NFPA No. & Edition _____ **c) Section/Paragraph** _____
2. **Proposal Recommends:** *(check one)* ☐ **new text** ☐ **revised text** ☐ **deleted text**
3. **Proposal.** *(Include proposed new or revised wording, or identification of wording to be deleted.)* Note: Proposed text should be in legislative format, that is, use underscore to denote wording to be inserted (inserted wording) and strike-through to denote wording to be deleted (~~deleted wording~~). _____
4. **Statement of Problem and Substantiation for Proposal.** Note: State the problem that will be resolved by your recommendation. Give the specific reason for your proposal including copies of tests, research papers, fire experience, etc. If more than 200 words, it may be abstracted for publication. _____
5. ☐ **This Proposal is Original Material.** Note: Original material is considered to be the submitter's own idea based on or as a result of his/her own experience, thought, or research and, to the best of his/her knowledge, is not copied from another source.

   ☐ **This Proposal is Not Original Material; Its Source *(if known)* is as Follows:** _____

I hereby grant the NFPA all and full rights in copyright to this proposal, and I understand that I acquire no rights in any publication of NFPA in which this proposal in this or another similar or analogous form is used.

Signature *(Required)* _____

PLEASE USE SEPARATE FORM FOR EACH PROPOSAL • NFPA FAX (617) 770-3500

Mail to: Secretary, Standards Council • NFPA • 1 Batterymarch Park • PO Box 9101 • Quincy, MA 02269-9101

Copyright National Fire Protection Association
Provided by IHS under license with NFPA
No reproduction or networking permitted without license from IHS
Not for Resale