NFPA® 1452

Guide for Training Fire Service Personnel to Conduct Community Risk Reduction

2015 Edition

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NFPA® 1452

Guide for

Training Fire Service Personnel to Conduct Community Risk Reduction

2015 Edition

This edition of NFPA 1452, *Guide for Training Fire Service Personnel to Conduct Community Risk Reduction*, was prepared by the Technical Committee on Fire Service Training. It was issued by the Standards Council on November 11, 2014, with an effective date of December 1, 2014, and supersedes all previous editions.

This edition of NFPA 1452 was approved as an American National Standard on December 1, 2014.

Origin and Development of NFPA 1452

This text was developed by the Committee on Fire Service Training and processed in accordance with NFPA Regulations Governing Committee Projects. This guide was a revision of and replacement for the NFPA booklet entitled *How to Train Fire Fighters to Make Dwelling Inspections*. The 2000 edition of this document was a complete revision of the 1993 edition. It included updated statistics and public safety and educational information that had not been included in prior editions.

The 2005 edition of this document was a complete revision of the 2000 edition. The previous numbering of chapters and paragraphs was changed to reflect requirements of the *Manual of Style for NFPA Technical Committee Documents*.

The 2010 edition brought terminology up to date, revised Chapter 9, Wildland/Urban Interface, and added a new Chapter 10 on All Hazards Education.

For the 2015 edition, the name has been changed to *Guide for Training Fire Service Personnel to Conduct Community Risk Reduction*, to reflect the change within the guide to an all-hazards approach.

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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 all fire service training techniques, operations, and procedures to develop maximum efficiency and proper utilization of available personnel. Such activities can include training guides for fire prevention, fire suppression, and other missions for which the fire service has responsibility.

Contents

Chapter 1 Administration **1452–** 4
1.1 Scope **1452–** 4
1.2 Purpose **1452–** 4

Chapter 2 Referenced Publications **1452–** 5
2.1 General **1452–** 5
2.2 NFPA Publications **1452–** 5
2.3 Other Publications **1452–** 5
2.4 References for Extracts in Advisory Sections **1452–** 5

Chapter 3 Definitions **1452–** 5
3.1 General **1452–** 5
3.2 NFPA Official Definitions **1452–** 5
3.3 General Definitions **1452–** 5

Chapter 4 Program Benefits **1452–** 5
4.1 Material Distribution **1452–** 5
4.2 Support of Other Programs **1452–** 6
4.3 Continuing Community Risk Reduction Programs **1452–** 6

Chapter 5 Planning the Community Risk Reduction Program **1452–** 6
5.1 General **1452–** 6
5.2 Publicity **1452–** 6
5.3 Training **1452–** 6
5.4 Program Duration **1452–** 6
5.5 Community Risk Reduction Procedures **1452–** 7
5.6 Communications **1452–** 8
5.7 General Procedures **1452–** 8

Chapter 6 Common Hazards Found in Homes ... **1452–** 8
6.1 General **1452–** 8
6.2 Careless Use of Candles, Smoking Materials, Matches, and Other Open-Flame Devices **1452–** 8
6.3 Electrical Installations **1452–** 8
6.4 Flammable Liquids **1452–**10
6.5 Heating Systems and Appliances **1452–**10
6.6 Housekeeping, Storage, and Rubbish Hazards **1452–**11
6.7 Fire Safety Precautions in Earthquake-Prone Areas **1452–**12
6.8 Flammable Gases **1452–**12

Chapter 7 Life Safety Considerations **1452–**12
7.1 Exit and Escape Routes **1452–**12
7.2 Fire Exit Drill Plan **1452–**12
7.3 Occupants with Special Needs **1452–**13
7.4 Smoke Alarms and Other Early Warning Devices **1452–**13
7.5 Poisons **1452–**13
7.6 Carbon Monoxide Detectors **1452–**13

Chapter 8 Fire-Extinguishing Equipment **1452–**13
8.1 Fire Extinguishers **1452–**13
8.2 Residential Automatic Fire Sprinkler Systems **1452–**13

Chapter 9 Wildland/Urban Interface Fire Safety **1452–**14
9.1 General **1452–**14
9.2 Precautions **1452–**14
9.3 Emergency Evacuation Preparations **1452–**14

Chapter 10 All-Hazards Education **1452–**14
10.1 General **1452–**14
10.2 Emergency All-Hazards Evacuation Preparations **1452–**14
10.3 All-Hazards Concerns **1452–**14
10.4 Preparation **1452–**15

Chapter 11 Home Visit Forms **1452–**15
11.1 General Information **1452–**15
11.2 Confidentiality of Results **1452–**15
11.3 Retaining Results **1452–**15
11.4 Other Assistance **1452–**15
11.5 Community Partnerships **1452–**15
11.6 Program Evaluation **1452–**15

Annex A Explanatory Material **1452–**15

Annex B Informational References **1452–**18

Index **1452–**19

NFPA 1452

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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 extracts in advisory sections of this document are given in Chapter 2 and those for extracts in the informational sections are given in Annex B. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text should be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex B.

Chapter 1 Administration

1.1 Scope. The intent of this document is to provide fire department training officers or other fire service personnel with a guide for the establishment of a community risk reduction program for residential occupancies.

1.1.1 To be effective and to adequately deal with local fire problems, the solution to a particular fire safety problem should be developed locally. This document is intended to be a basic guide to possible elements for inclusion in a locally developed program.

1.1.2 Because the majority of fire deaths occur in residential occupancies, it is essential that community risk reduction programs become an integral part of the total fire and life safety programs in a community. This guide can be applied to both rural and urban communities. Principles contained in this document can be applied to single-family as well as multifamily residential occupancies, such as apartments, town houses, and condominiums, and manufactured housing, as local conditions dictate.

1.1.3 This document is not intended to be a training manual or a fire inspection manual, but rather to serve as a guide for establishing a locally prepared community risk reduction program geared to address the specific problem(s) faced by the local fire service organization. By utilizing fire suppression personnel in this capacity, fire departments can achieve some or all of the following benefits:

(1) Increased productivity
(2) Increased community contact
(3) Familiarization with residential properties
(4) Encourage life safety practices
(5) Prevent fires
(6) Prevent injuries
(7) Decrease crime
(8) Work with diverse cultures in a place of their comfort

1.1.4 Residents of the community also benefit from a survey program by becoming aware of the following issues:

(1) Fire and life safety in the home
(2) Protective measures to improve the quality of life
(3) Public safety and awareness
(4) Existing conditions and life safety practices

1.1.5 Specific sections of this guide can be included or eliminated as local conditions dictate.

1.2 Purpose. The purpose of this guide is to assist fire department personnel in designing and implementing a community risk reduction plan as part of a community-wide fire and life safety education program to reduce the burden of fire incidents, injuries and deaths, crime, and property losses in the jurisdiction served.

1.2.1* Fire incidence and losses continue to challenge all communities in the United States. Fire is a leading cause of injuries and deaths in the home, and residential fires account for approximately 80 percent of all fire incidents and deaths each year.

1.2.2 The local fire department is responsible for the protection of life and property from fire and related threats. A major part of that responsibility is public fire and life safety education. Educating citizens about fire and life safety will shift some degree of all-hazards prevention responsibility to each person in the community, thus making fire department personnel more effective in delivering a full range of fire protection services. Basic information for the public should include emergency behaviors in case of fire; the proper installation, maintenance, and use of smoke alarms; carbon monoxide (CO) detectors; residential sprinklers; radon detection; crime prevention; and a residential all-hazards action planning effort. An effective home survey community risk reduction program is a primary method of all-hazards prevention, with proven success in reducing loss of life, injury, and property damage from fire and other risks and hazards present in the community.

1.2.3* In addition to reducing loss of life and property damage, an effective home fire and life safety program can generate the following opportunities, which benefit the department and the entire community:

(1) Publicizing year-round community programs and activities (fostering the perception that citizens who support the fire department are getting more for their money in terms of a comprehensive fire service organization)
(2) Meeting residents of the community on a one-to-one basis and distributing various fire prevention literature, telephone stickers, and other fire safety information
(3) Installing smoke alarms where none currently exist in homes occupied by high-risk residents
(4) Answering specific fire protection or all-hazards fire and life safety inquiries
(5) Allowing fire fighters to become better acquainted with street names and layouts, hydrant and water supply locations, community development, and home construction, as well as pre-fire planning
(6) Using inquiries (4) and other useful information for discussion during training sessions

(7) Using fire apparatus regularly, thereby improving driver proficiency
(8) Increasing the productivity of fire fighters, specifically in fire service–related duties
(9) Assisting the professional development of fire fighters engaged in the program's activities
(10) Allowing the fire service to become acquainted with construction types, interior designs, avenues of fire spread, and locations of various concealed spaces (e.g., determining the entrance to attics and crawl spaces prior to an emergency)
(11) Improving fire service personal accountability and mutual trust with community residents
(12) Providing "all-hazards" information based on issues identified with local data
(13) Creating the potential for a community partnership with the police department to provide crime prevention information to residents

1.2.4 As worthwhile as the fringe benefits of 1.2.3 are, the most important responsibility is conducting community risk reduction activities in order to reduce fire and life safety hazards and to provide effective public all-hazards prevention education throughout the community.

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this guide and should be considered part of the recommendations of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 10, *Standard for Portable Fire Extinguishers,* 2013 edition.

NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes,* 2013 edition.

NFPA 70®, National Electrical Code®, 2014 edition.

NFPA 72®, National Fire Alarm and Signaling Code, 2013 edition.

NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel–Burning Appliances,* 2013 edition.

NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment,* 2015 edition.

NFPA 1144, *Standard for Reducing Structure Ignition Hazards from Wildland Fire,* 2013 edition.

2.3 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Advisory Sections.

NFPA 72®, National Fire Alarm and Signaling Code, 2013 edition.

NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment,* 2015 edition.

NFPA 1144, *Standard for Reducing Structure Ignition Hazards from Wildland Fire,* 2013 edition.

Chapter 3 Definitions

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

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 Guide. A document that is advisory or informative in nature and that contains only nonmandatory provisions. A guide may contain mandatory statements such as when a guide can be used, but the document as a whole is not suitable for adoption into law.

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

3.3 General Definitions.

3.3.1 Carbon Monoxide Detector. A device having a sensor that responds to carbon monoxide gas that is connected to an alarm control unit. [**720,** 2015]

3.3.2* Community Risk Reduction (CRR). A practice or approach for providing all-hazards protection to a community.

3.3.3 Home. One or more rooms arranged for complete, independent housekeeping purposes, with space for eating, living, and sleeping; facilities for cooking; and provisions for sanitation.

3.3.4* Radon. A colorless and odorless radioactive gas that is derived from the decay of uranium.

3.3.5 Smoke Alarm. A single or multiple-station alarm responsive to smoke. [**72,** 2013]

3.3.6* Structure Ignition Zone. The area around a specific structure and associated accessory structures, including all vegetation that contains potential ignition sources and fuels that can affect ignition potential during an intense wildland fire. [**1144,** 2013]

3.3.7 Wildland Fire. An unplanned and uncontrolled fire spreading through vegetative fuels, at times involving structures. [**1144,** 2013]

3.3.8* Wildland/Urban Interface. The presence of structures in locations in which the AHJ determines that topographical features, vegetation fuel types, local weather conditions, and prevailing winds result in the potential for ignition of the structures within the area from flames and firebrands of a wildland fire. [**1144,** 2013]

Chapter 4 Program Benefits

4.1 Material Distribution. Fire and life safety visits to homes provide the fire department with one of the best means of delivering public all-hazards prevention education through direct contact with residents of the community. Maximum effectiveness can be accomplished through the distribution of life safety all-hazards prevention literature and education directed at the local fire and life safety problems. Fire fighters can explain specific items in the literature and answer questions that homeowners might have on specific fire department community risk reduction campaigns. Many fire departments find it advantageous to print special cards, certificates, or door stickers to recognize homeowners whose homes are found to be in good, all-hazards safe condition.

4.2* Support of Other Programs. Personal visits by fire fighters to homes for community risk reduction and all-hazards prevention generally improve the fire department's public image in the community. The program enables fire fighters to install smoke alarms, distribute information, and provide teaching on the use and placement of smoke alarms and carbon monoxide (CO) detectors and the dangers of radon, the benefits of residential sprinklers, home fire escape planning, safety hints for babysitters, and a variety of other community risk reduction safety-related subjects. Fire fighters can supplement the residential community risk reduction visits by giving homeowners and occupants telephone stickers or cards showing the emergency telephone numbers and procedures for sending a fire alarm. Additionally, the community risk reduction program can identify the increasing numbers of unregulated day care and adult care centers in residential occupancies.

4.3 Continuing Community Risk Reduction Programs. In the planning stages of a community risk reduction program, the fire chief and fire officers should look beyond the immediate short-term benefits, anticipating its extension and continuation as a permanent program. Although the initial home community risk reduction activities can be a resounding success, the fire department should continue to analyze and evaluate the effectiveness of the program and its continued ability to address the current local fire and life safety problems. The fire department should realize that planning, implementation, and evaluation processes should be a continuous cycle that reacts to the varying needs of the community. The experiences of fire departments that have initiated successful community risk reduction programs have led them to retain these activities year after year. The success of these programs has, in some communities, resulted in a dramatic reduction in life and property loss from fire and other community hazards.

Chapter 5 Planning the Community Risk Reduction Program

5.1 General.

5.1.1 Careful planning and preparation are essential if a community risk reduction program is to be successful.

5.1.2 The chief of the fire department should demonstrate a commitment to the planning and execution of the program. Every department member is responsible for educating the people of the community about the benefits of the program. The items to consider when the program is planned are presented in Sections 5.2 through 5.7.

5.2 Publicity. Community risk reduction should be "sold" to the public. The fire department should use its website and department vehicles to actively promote community risk reduction efforts. Homeowners and other residential occupants should be fully informed of the value of community risk reduction activities, including how such activities can save lives, reduce injuries, and protect their homes from all hazards. Education can be accomplished by enlisting the assistance of local radio and television stations and newspapers to inform the public of the purpose and benefits of the community risk reduction program activities. The local chamber of commerce, community service clubs, church groups, fraternal orders, and schools should be contacted for additional program support. Generally, most of these organizations are glad to cooperate. Careful planning and widespread community support will increase the overall success of these programs.

5.3 Training.

5.3.1 One of the most important phases of any training program is teaching fire fighters to apply the knowledge gained to a practical situation. Fire fighters should be able to recognize hazards of all types and make proper recommendations for correction. They should also be able to explain and offer reasons for the corrections suggested. For example, a fire fighter should be prepared to recommend the installation of safety devices, such as smoke alarms, fire extinguishers, and carbon monoxide (CO) and radon detectors, and to specify proper locations for their installation. Fire fighters should be knowledgeable in recognizing fire and life safety hazards and be technically informed about the recommended methods for their removal. Fire fighters should project an image and attitude that leaves a positive, lasting impression.

5.3.2 Visual and mechanical training aids are extremely useful to achieving these goals in training fire fighters. For example, color slides showing typical fire and life safety hazards and faulty installations should help fire fighters recognize hazards. It is suggested that training officers seek the aid of technically qualified individuals, such as building inspectors and electrical inspectors, to assist in instructing fire fighters in the use and application of local codes and building regulations pertaining to fire protection and fire and life safety hazards prevention.

5.3.3* Fire fighters should be thoroughly trained before being sent out on their own to conduct community risk reduction activities. Training should consist of classroom instruction and application of knowledge and principles in the field of fire and life safety hazards prevention.

5.3.3.1 Classroom instruction should include the following:

(1) Proper methods of introduction and explanation of program rationale for the homeowner or building occupant
(2) Proper methods of securing permission from the homeowner to perform the home visit (homeowner allowed to refuse entry)
(3) Common fire and life safety hazards that can be expected to be found in a home
(4) Provisions of the local fire and building code that are applicable to homes (Inspections generally should be made as a courtesy, not because of fire and building code regulations.)

5.3.3.2 Training officers should take fire fighters into the field for supervised on-the-job training before fire fighters are allowed to perform all-hazard visits on their own. This procedure allows fire fighters to build confidence in their visits under the supervision of an experienced individual. Field visits with an experienced training officer should be continued until the training officer is sure the fire fighters are competent and at ease when they deal with the public. Home risk reduction activities should be conducted by at least two fire fighters. However, the presence of too many fire fighters at a single home could be perceived as an authoritative force, causing a negative occupant reaction to any risk reduction activities.

5.4 Program Duration. Community risk reduction visits of homes should be done on a year-round basis. The program should contain elements to be emphasized during specific times of the year, such as access to fire hydrants or heating equipment problems during winter months. Summertime block parties are a good time to interact with and educate residents on fire and life safety matters.

5.5 Community Risk Reduction Procedures.

5.5.1 Before leaving the station, the officer in charge should ensure that all fire fighters are in proper uniform and are properly equipped. A dress uniform is recommended; however, if one is not available, a clean work uniform with proper insignia or identification is necessary.

5.5.2 Fire apparatus utilized by the surveying fire fighters should be kept in proximity to the area being surveyed to facilitate a quick response to an emergency alarm. Alarm notification can be accomplished through the use of normal and accepted wireless communications, or one member can be assigned to stay with the apparatus to notify the remaining crew members through a predesignated signal, such as sounding the vehicle siren or air horn.

5.5.2.1 Those fire fighters assigned to conduct the home visits should notify dispatch that they are in the area.

5.5.2.2 Personnel assigned to the vehicle should be aware and cautious of children in the vicinity of the vehicle, particularly during times of vehicle movement.

5.5.2.3 Personnel should also be prepared to answer questions from the public relating to the apparatus and to fire and life safety in general.

5.5.2.4 Consideration should be given to carrying a sign on the side of the apparatus explaining that community risk reduction activities are in progress in the area to improve fire and life safety. The banner or sign should also state that the unit is in service and responds to emergencies during the in-service activity.

5.5.3 The officer in charge should assign teams of fire fighters to make contact at homes in their first due district. Most fire departments rely on two-person teams to do risk reduction activities, for the protection of the survey personnel and because the conduct of single fire fighters could be subject to unverifiable accusations.

5.5.3.1 A home should be approached by a walkway or path, not by walking across the lawn.

5.5.3.2 Fire fighters should follow departmental procedures and policies for dealing with the public.

5.5.3.3 If the occupant is home, the fire fighters should introduce themselves, show proper identification, explain the purpose of the visit, and ask permission to enter. If a publicity campaign has been properly conducted, the occupant will know why the fire fighters are there.

5.5.3.4 If admittance is refused, the fire fighters should thank the occupant and leave appropriate all-hazards materials.

5.5.3.5 If no one is home, a card should be left explaining that the visit was made and asking the occupant to call the fire station for an appointment to reschedule the visit.

5.5.4 Once inside the home, the visit should begin without delay. The fire fighters should be helpful and courteous at all times. They should take care to avoid unnecessary conversation, because they can overlook a potential fire and life safety hazard and slow the visit. Because fires and other life safety hazards can occur in any room, the entire home should be surveyed. However, if the occupant objects to visiting certain rooms, the occupant's wishes should be respected. Closets and cabinets should be opened by the homeowner rather than the fire fighters.

5.5.5 Fire fighters should remember that a home visit is voluntarily accepted by the occupant. The occupant should be asked to accompany the fire fighters to see and to hear explanations of any fire and life safety hazards. If the occupant is unable to accompany the fire fighters, the visit should be rescheduled for a more convenient time.

5.5.6* Fire and life safety hazards identified should be noted on the visit form. This form is a list only of recommendations, not of violations. However, if a hazardous situation that violates local fire and building code regulations is found, it should be recorded by the fire department. For example, most fire and building codes require the installation of smoke alarms and CO detectors in residential occupancies. If surveying fire fighters find a home where smoke alarms and CO detectors are not present, it will provide the fire fighters an opportunity to install smoke alarms in the home during the visit. If the resident refuses permission to install smoke alarms, the resident should be advised to obtain the required type and number, and a notation of the recommendation should be made. Many fire departments install smoke alarms and/or CO detectors free of charge to the residents. During the visit, the fire fighters should not argue any point but merely make suggestions. The purpose of the visit is to eliminate hazards to life and property, and all conversations should be directed toward that goal.

5.5.7 The visit form should be filled out completely and in duplicate. The fire department should give serious consideration to omitting specific name and address information from the visit sheet.

5.5.7.1 If no hazards are found during the visit, the occupant should be complimented for his or her efforts. Prior to leaving the premises, the fire fighters should sign the visit sheet, and the original should be left with the occupant.

5.5.7.2 Particular attention should be given to the legal considerations of the visit form. Any form that is utilized should be reviewed and approved by the fire department's legal counsel.

5.5.8 Questions asked about the department should be answered. Questions regarding policy matters should be referred to the company officer and should not be answered by fire fighters. If the answer to any question is not known, fire fighters should research the matter and advise the resident as soon as possible. Fire fighters should realize that many persons will base their opinion of the entire fire department on this one contact; therefore, a professional attitude and demeanor should be maintained at all times.

5.5.9 Many fire departments have discontinued providing window decals for invalids because these signs can identify the home as an easy target for burglary or robbery. A more popular alternative to invalid stickers is keeping in the fire communications center a manual or computerized listing of invalids or persons needing special assistance, whereby responding fire companies can be given the information en route to an emergency location. Because of the declining percentage of residential occupancies equipped with landline telephone service, consideration should be given to a public education effort on how to report an emergency on a cell phone to include the address of the incident and the community.

5.5.10 Prior to leaving the premises, the fire fighters should make sure the occupant understands any fire and life safety hazards that have been found and what corrective action should be taken. Literature should be provided, and an invitation should be issued to the occupant to stop by the fire station

any time he or she has a question relating to fire or life safety or is interested in learning more about services offered by the fire department. Last, but not least, the occupant should be thanked for allowing the home visit.

5.6 Communications. When community risk reduction survey programs are being planned, some provisions should be made for specific communications between the home visit teams and headquarters. Usually, fire apparatus operators can handle these communications, but occasionally the officer in charge will need to notify headquarters of certain hazardous situations or other important information. The use of portable two-way radios or pagers should be considered as a means of ensuring prompt notification and quick response to an emergency while fire units are in the field conducting community risk reduction home visits. Portable radios should be operated at low volume to avoid disturbing occupants, especially children.

5.7 General Procedures.

5.7.1 The fire chief should identify the goals and objectives of the community risk reduction program, which can include the percentage of homes to be surveyed, areas of operation, the schedule of surveys, and other matters of general policy.

5.7.2 General procedures should also be developed to utilize the information obtained and to conduct a periodic program evaluation to identify any changes to the program operation that would increase its effectiveness.

Chapter 6 Common Hazards Found in Homes

6.1 General.

6.1.1 The explanations of fire and life safety hazards in this chapter should be adapted to local regulations and codes and should be included in a home visit report form designed to apprise the resident of hazards found, corrective measures required, and other recommendations of the home visit team.

6.1.2 Other hazards that can be a problem in the specific community should also be described on the form.

6.1.3 Fire fighters should carry fire and life safety pamphlets, along with a copy of the home visit report form, for distribution at the completion of the home visit.

6.2 Careless Use of Candles, Smoking Materials, Matches, and Other Open-Flame Devices.

6.2.1 Unattended lit candles, careless smoking, and the improper disposal of matches and other open-flame items that can cause ignition are common causes of fire.

6.2.1.1 Fire fighters conducting home visits should ascertain whether there are smokers in the household and suggest the use of adequate fire-safe ashtrays and proper disposal of smoking materials and ashes.

6.2.1.2 Fire fighters should explain the fire dangers associated with unattended lit candles and smoking in bed or when extremely fatigued. They should suggest that furniture upholstery be checked after parties and before retiring for the evening.

6.2.1.3 The following items are among those that should be noted during the survey:

(1) Ashtrays located in bedrooms, especially on night tables or within arm's reach of the bed
(2) Burn marks on table tops, furniture upholstery, rugs, and other locations
(3) The location and storage of matches and whether they are secure from small children (Matches and lighters should always be kept up high and out of sight and reach of children, preferably in a locked cabinet.)
(4) Ornamental cigarette lighters on coffee tables or pocket lighters left lying around (Fire fighters should explain that these items are attractive to children. Lighters can present an extreme safety hazard; not only could they be used to start a fire, but an inexperienced individual could be burned by them.)
(5) Candles and other open-flame devices used in the home

6.2.2 The following additional items should be covered in a home visit:

(1) Poison potential of home cleaning and other common household products
(2) Fall hazards
(3) Tripping hazards
(4) Scalding risks with cooking and bathing
(5) Combustible items within 3 ft (1 m) of a heat source
(6) Radon checks

6.2.3 A common fire occurrence deserves special warning. All too often, residents extinguish fires in upholstery or in mattresses without calling the fire department, then retire for the night, thinking the fire is out. Because of the deep-seated nature of these fires, total extinguishment is extremely difficult. When sufficient oxygen is provided, sometimes hours later, the upholstery could re-ignite, resulting in a serious fire and loss of life. Even under conditions in which fire will not propagate, volumes of carbon monoxide and other harmful gases can rise to lethal levels unbeknownst to persons sleeping in the home. The occupant should be told to notify the fire department of all fires in and around the home, even if they seem minor.

6.3 Electrical Installations.

6.3.1 Violations and Hazards. Problems in electrical installations and equipment are generally associated with several types of violations or with a misunderstanding of an item's design features. A great deal of technical knowledge is required for recognition of improper design features. Hazards might be hidden from view by a building's configuration. However, telltale signs of problem areas are recognizable to the trained fire fighter. Any issues should be identified to the occupant for further investigation by a qualified electrician.

6.3.2 Overcurrent Protection.

6.3.2.1 The commonly used overcurrent protection devices for the protection of feeders, circuits, and equipment are fuses, circuit breakers, and thermal overload units. The basic purpose of the fuse, circuit breaker, or fuse cartridge is the same: to open the circuit if the electrical current reaches a value that will cause an excessive or dangerous temperature in the conductor, a condition becoming more common with increasing numbers of electrical appliances. This safety feature is negated when a fuse or circuit breaker of a higher-rated capacity is used to replace one of a lower rating (e.g., replacing a 15 amp fuse with a 30 amp fuse) or by bridging the circuit by placing a conductor behind the fuse.

6.3.2.2 It can be difficult to determine such overloading unless fire fighters know the gauge of the wire used in the circuit and the electrical devices it feeds. Normally, the only way to determine improper overloading is to remove the fuse and

examine it for excessive heating at the fuse base. It should also be checked for the presence of metallic bridging. Overheating can also be the result of a loose fuseholder, or the fuse might be shorted. Residents should be requested to label branch circuits in the space provided on the panel box door.

6.3.2.3 Circuit breaker overloading is more difficult to determine without tracing the circuit that it protects. Explaining the design features of fusing to the occupant might be the best way to determine an unintentional violation. Any differences in the physical appearances of circuit breakers in a panel could be an indication of circuit overloading and is worthy of further investigation by a qualified electrician.

6.3.2.4 Ground-fault circuit interrupters (GFCIs) are devices that sense when current, even a small amount, passes to ground through any path other than the proper conductor. When this situation occurs, the GFCI trips almost instantly, stopping the flow of current in the circuit and through the person receiving the ground-fault shock. *NFPA 70* requires GFCI protection on all 125 V, single-phase, 15 and 20 amp receptacle outlets installed outdoors where there is direct grade-level access to the home and to the receptacles. GFCI protection is also required for 125 V, single-phase, 15 and 20 amp receptacles installed in garages, in crawl spaces at or below grade level, in unfinished basements, within 6 ft (2 m) of a kitchen sink where receptacles serve countertop surfaces, and in bathrooms. Receptacles located within 20 ft (6 m) of the inside walls of a permanently installed pool, fountain, or similar location should also be protected by a GFCI.

6.3.2.5 If GFCIs are found in the course of a survey, the occupant should be requested to operate the test button on the unit to determine whether the unit is operating correctly. If it is, the reset button will pop out and the circuit will open. The GFCI is returned to normal mode by depressing the reset button. If non–GFCI-protected receptacles are found near sinks or outdoors, the occupant should be advised of the safety advantages to be gained by replacing them with GFCI-type receptacles.

6.3.3 Grounded Receptacles.

6.3.3.1* *NFPA 70* requires all electric service to be grounded. Receptacles installed on 15 and 20 amp branch circuits are required to be of the grounded type and should be effectively grounded. Testing meters are available that when inserted into receptacles indicate proper grounding of the receptacle. Local electrical inspectors can be helpful in explaining local codes in fire department training sessions.

6.3.3.2 Even though older homes might not have grounded receptacles, major appliances, such as dishwashers, dryers, washing machines, and garbage disposals, should be grounded externally, or special grounded branch circuits should be provided for them. Fire fighters should be especially alert for the use of three-pronged plugs whose grounding prong has been removed or on which adapters have been attached to mate with two-prong polarized outlets. Such practices can give rise to a shock hazard for users of such appliances, and the occupant should be so advised.

6.3.4 Outdoor Electrical Service. Electrical main service coming into the homes should be inspected. Cables that are too close to trees, swimming pools, spas, saunas, antennas, downspouts, or gutters or that are not securely attached to the building could present a life safety or fire hazard. Outdoor antennas should not be attached to any electric service raceway or service mast. Live vegetation such as trees should not be used for the support of outside overhead conductors. Underground branch circuits are permitted to be used for this supply to outdoor lighting fixtures and associated electrical equipment on trees.

6.3.5 Other Common Electrical Hazards Found in the Home.

6.3.5.1 Heat buildup occurs in wiring when resistance to electrical current flow is experienced. Loose wire nuts or cable connections (especially in aluminum wiring), wiring run through doorways or under carpeting, and furniture or other heavy objects resting on wires can produce this condition.

6.3.5.2 Unusual wear to insulation on wiring can result from cables not being properly secured, objects hanging on cables, or, as described in 6.3.5.1, wiring run through doorways or under carpeting.

6.3.5.3 Dirty, poorly maintained electric motors or missing covers on junction boxes can eventually result in a short circuit or a fire. All unused openings (knockouts) in boxes and cabinets (panel boards) should be properly closed.

6.3.5.4 Extension cords (even though UL listed) can be too small for certain electrical loads, such as irons and air conditioners. Extension cords should never be used for permanent connections; they should be used only temporarily. If fire fighters are to provide worthwhile guidance to the occupant, they should be trained to match the current-carrying capability of the extension cord with the current demand of the electrical loads connected to it.

6.3.5.5 "Octopus" fittings allow an oversupply of electrical devices to be connected to one outlet, causing excessive current flow with resultant heat buildup. Power strips with integral overcurrent protection should be recommended to replace octopus fittings.

6.3.5.6 Insulation that is damaged is unsafe, and its breakdown could be imminent. Damaged insulation is often a problem, especially on powered hand tools. It should be recommended that such wiring be replaced.

6.3.5.7 To avoid possible ignition should a gas leak occur, electrical outlets or fuse panels should not be located adjacent to gas meters or gas diaphragms.

6.3.5.8 The use of appliances, fixtures, and wiring that are not listed by a testing laboratory should be discouraged.

6.3.5.9 The use of child safety covers should be recommended on all electrical outlets in homes that have young children. Such plugs are intended to cover the receptacle openings so that a child cannot insert a conductive object.

6.3.5.10 Clear spaces should be kept around all electrical panels.

6.3.5.11 Heat tapes used in manufactured housing and other homes should be examined by the homeowner or occupant once a year in the fall. Burn marks, damaged insulation, or evidence that an animal has been chewing on the insulation are signs that the heat tapes should be replaced or repaired. Heat tapes should be plugged in before freezing temperatures are anticipated and unplugged in the spring.

6.3.5.12 Where the fire fighter encounters lighting fixtures with halogen bulbs, the occupant should be advised of the hazard presented by the high temperature of such bulbs and the need to keep combustibles well away from them. Many

manufacturers of such fixtures have developed guards for installation over bulbs. (Other types of bulbs also can get hot enough to cause fires if they come into contact with light combustible materials such as window curtains.)

6.3.5.13 Most modern television receivers, stereo components, VCRs, and DVD players have a so-called instant-on feature. These units are energized when plugged into a wall. The occupant should be advised that it is a good practice to unplug such units when leaving home for an extended period of time.

6.4 Flammable Liquids. Home fires caused by flammable liquids usually result from the improper storage and use of such liquids. The properties of these materials are generally misunderstood. Common areas of concern to fire fighters should include the issues discussed in 6.4.1 and 6.4.2.

6.4.1 Storage and Dispensing Practices.

6.4.1.1 Flammable liquids such as gasoline should be stored only in listed safety cans of substantial design and construction and of a type approved by the authority having jurisdiction. Glass jars, unapproved plastic containers, or open pails and buckets should never be used. Flammable liquids should be handled and disposed of only in well-ventilated areas free from sources of ignition.

6.4.1.2 Storing excessive quantities of flammable liquids should be discouraged. Fire fighters should look for excessive amounts of flammable liquids stored in basements or garages, especially during times of shortages of such products. Even if stored in approved containers, flammable liquids exposed to heat can result in the escape of vapors through vent holes or other openings. Flammable liquids should not be stored in basements or near potential sources of ignition.

6.4.1.3 The use of flammable liquids as solvents for removing grease, oil, or paint is extremely dangerous. Such practices should be discouraged. Most flammable liquids used in the home produce vapors heavier than air and thus sink to the floor and spread. If the vapors reach a source of ignition, even at a considerable distance, an explosion and fire can result. A light switch, for example, can produce a spark capable of igniting vapors.

6.4.1.4 Greasy or oil-paint–soaked rags and brushes can also cause fire from spontaneous ignition. They should be cleaned and washed after each use and air-dried outside. Paint manufacturers' instructions should be consulted regarding cleanup and disposal.

6.4.2 Other Flammable Liquid Hazards.

6.4.2.1 Using flammable liquids in the home for dry-cleaning purposes should be discouraged.

6.4.2.2 Smoking when using flammable liquids should be discouraged.

6.4.2.3 Using flammable liquids to start fires in stoves or fireplaces is a dangerous practice and should be discouraged.

6.4.2.4 The use of liquid charcoal starters should be restricted to products marketed specifically for that purpose. Applying these products after ignition is achieved, whether or not live flame is noted, is extremely hazardous. Flame can be transmitted to the container contents, with resultant ignition and pressure explosion.

6.4.2.5 Fire fighters should be aware that many occupants in homes might be frying food with propane-fueled cookers in garages and other indoor areas. Fire fighters might find that the kitchen stove is being used as one big fry pan covered with foil. BBQ grills might also be used in homes to help with the high cost of home heating fuels.

6.5 Heating Systems and Appliances.

6.5.1 General Hazards. Types of heating systems vary in different climates. Homes built in recent years usually have gas- or oil-fired furnaces or electrical heating. Homes might also have coal or wood heating units. Increased fuel costs have brought about an increase in the use of wood-burning appliances. Room heaters and portable heaters are also common in some areas.

6.5.1.1 A common hazard is the storage of combustible materials where they can be ignited by heat radiated or conducted by a furnace, stove, or other heating appliance. The area around any heating appliance should be kept free of combustibles. Heating units also require sufficient space around them to provide adequate ventilation for proper combustion.

6.5.1.2 Flues and smoke pipes can constitute a hazard; both should be kept in good condition and have adequate clearance from any combustibles. Smoke pipes should be kept as short as possible. If more than 3 ft (1 m) in length, they should be supported by hangers. Flues should be cleaned annually and inspected for damage or holes. In addition, throughout the heating season, checks should be made for creosote buildup in the flue pipe and chimney connected to coal- and wood-burning appliances. When buildup is evident, the system should be cleaned. Care should be taken to inspect chimneys and flues that pass through attic areas. Where flues pass through partitions, they should have sufficient clearance or be protected by an approved, ventilated metal thimble.

6.5.1.3 Steam pipes or steam-heating appliances improperly spaced from wood surfaces can result in lower ignition temperatures over long periods of exposure. In some cases, pyrolitic decomposition of the wood fibers has caused ignition at temperatures as low as 150°F (65°C).

6.5.2 Types of Heating Systems.

6.5.2.1* Gas-Fueled Systems. Gas heating systems can be supplied by natural, manufactured, or liquefied petroleum gas. Piping should be of an approved type and in good condition; loose connections and poor piping are hazardous. The burner should be properly adjusted. A check should be made for any odor of gas. Where individual gas heaters are distributed throughout the home, fire fighters should check to ensure that they are properly secured and vented.

6.5.2.2 Oil-Fired Systems. Several types of heating devices use oil.

6.5.2.2.1 Some homes with central heating use an oil burner to heat water, which is then distributed to radiators or baseboard systems. Large oil tanks can be located in the basement and should be properly installed, with tight connections. A quick check will show whether there are any leaks or whether a tank is unsecured. If a leak is found, sand should be spread to confine the leakage, or an emergency patch should be placed on the leak. The homeowner should replace leaking or damaged tanks immediately.

6.5.2.2.2 In climates where heat is only occasionally required, small oil or kerosene heaters can be used. Condition of the flue pipe and tank and security of the installation should be inspected. These devices should be mounted on metal trays to prevent overflow of liquid onto the floor.

6.5.2.3 Coal and Wood Furnaces. These solid fuel furnaces radiate a lot of heat. Their flues should have at least an 18 in. (457 mm) clearance from any combustible material. Solid fuel can also cause more damage to smoke pipes than other types of fuels. Installations with covered pipes should be periodically inspected for loose or missing covering, which can cause a fire. Improper storage of fuel or ashes can result in a fire. Fuels should be stored in bins. Ashes should be placed in metal containers and removed from the home.

6.5.2.4 Fireplaces. The use of factory-built fireplaces, fireplace stoves, and masonry fireplaces has increased for both heating and enjoyment. Spark screens should always be provided for a fireplace, and dampers, if any, should be of a type that can be operated from outside the fireplace. Listed or approved factory-built fireplaces and fireplace stoves that are designed to be placed directly on or immediately adjacent to combustible building construction should be installed strictly in accordance with the terms of the listing and the manufacturer's instructions. NFPA 211 should be followed. Masonry fireplaces should be checked to ensure that linings are free from cracks, and flues should be cleaned annually. Ashes should be placed in metal containers and removed from the home.

6.5.3 Cooking Appliances and Venting Systems.

6.5.3.1 Generally, fire hazards in cooking appliances and venting systems are associated with poor housekeeping practices. When pointing out such deficiencies, tact is imperative. Unless an obvious accumulation of grease or residue is present, general statements regarding the extinguishment of grease fires should serve as a reminder.

6.5.3.2 Grease ducts and vented hoods should be inspected for buildup of grease. Filters should be inspected and the resident cautioned about the dangers of fire transmittal and spread through these areas.

6.5.3.3 Electric ranges, wall-mounted ovens, and counter-mounted cooking units require a means of disconnection from the supplying electrical circuit. In freestanding household ranges, a separable connector or a plug and receptacle is sufficient. In wall-mounted ovens and counter-mounted cooking units or ranges without plugged receptacles, the circuit controlling the appliance should be well defined at the electrical panel.

6.5.3.4 Gas ranges should be equipped with an in-line gas cutoff valve located at the appliance. Pilot lights and gas valves should be checked for leakage and proper burning characteristics.

6.5.3.5 Gas appliances designed for cooking should not be used to heat rooms.

6.5.3.6 Fire fighters should inform the occupant about the dangers and effects of careless cooking, more popularly termed "food on the stove" problems. Recently tested cooking safety messages such as "Keep an eye on what you fry" proved to be very effective in educating home occupants.

6.5.3.7 Cooking vents should be cleaned in accordance with the manufacturer's instructions.

6.5.3.8 Occupants should be told to make sure they always use the exhaust fan while cooking.

6.5.4 Other Heating Devices.

6.5.4.1 Gas heaters should be of an approved type.

6.5.4.2 Portable electric heaters should be of an approved type and should be located away from combustibles. These devices should also be equipped with a tilt switch that causes the heater to shut off if it is overturned. Care should be exercised to avoid overloading electrical circuits. These devices should not be used in bedrooms while occupants are sleeping.

6.5.4.3 Use of portable kerosene space heaters as supplements to residential heating systems has increased. These units require additional safety information and consideration by the occupant. Rules for safe operation of these devices should include the following:

(1) Use only clean kerosene in these units. Do not use fuel oil or diesel fuel.
(2) Never use gasoline, naphtha, paint thinners, alcohol, or other volatile fuels.
(3) Use these units only in well-ventilated rooms.
(4) Operate these units on level surfaces only, away from drafts and wind.
(5) Locate these units at least 3 ft (1 m) from furniture and other combustibles. Keep draperies and clothing away from the top of the heater.
(6) Do not move, handle, or service these units while they are hot or burning. Ironically, in many jurisdictions it is a code violation to use these heaters but not a violation to own them. Fire fighters should be knowledgeable of state and local regulations, ordinances, and codes pertaining to portable kerosene heaters.
(7) Refueling should be performed outside of buildings.

6.5.4.4 Charcoal should not be burned in confined areas or in other than approved devices**.**

6.5.4.5 The use of outdoor grills on decks can be dangerous and may be prohibited in multifamily occupancies.

6.5.4.6 Gas- and oil-fired water heaters and furnaces found in closets or other rooms should not have combustibles stored next to them.

6.5.4.7 Small electrical appliances, such as toasters, coffee makers, televisions, and blenders, should be disconnected from power sources when not in use.

6.5.4.8 Solid fuel–burning stoves should be fueled only with hardwoods or other approved materials such as corn pellets or corn cobs.

6.6 Housekeeping, Storage, and Rubbish Hazards.

6.6.1 An occupant's reluctance to throw anything away can result in the storage of quantities of old clothes, magazines, newspapers, rags, and other material. Because a collection of these items is unsightly, the occupant often stores them in the attic, basement, closet, garage, or around the furnace. The occupant should be informed that these combustibles present a serious hazard, facilitating a fire's start, and should be removed.

6.6.2 There is an emerging awareness of safety hazards caused by compulsive hoarding. If fire fighters become aware of this type of situation, strong consideration should be given to making a referral to the building official, health inspector, fire prevention staff, or community mental health professionals.

6.6.3 Large quantities of trash and leaves around the exterior of a home are also a fire hazard. If the community provides pickup of household trash, trash should be stored in metal containers with tight-fitting metal lids until removed. If the occupant burns household trash on the premises, fire fighters should check the place of burning, type of incinerator, and condition and use with respect to local burning regulations.

6.6.4 Garages, both attached and unattached, should be included in any home visit. Even if unattached to the home, garages often represent exposure fire and carbon monoxide potential and afford many storage hazards.

6.6.5 During the course of the home visit, fire fighters should ask about the use of furniture waxes and polishes and, most important, about the storage of rags used to apply these products.

6.6.6 Use of portable home barbecue grills should be restricted to the outdoors. Charcoal briquettes should always be allowed to cool naturally and then be properly discarded. Charcoal should be stored in a dry area, because damp or wet charcoal is sensitive to spontaneous heating once dried.

6.6.7 If a residence has a pool or hot tub, fire fighters should review with the occupant the need for maintenance of pool fences, gates, locking devices, and other safety equipment to minimize risks to children. In addition, fire fighters should advise the occupant to maintain proper containment, handling, separation, and storage of pool chemicals. Pool chemicals should not be kept near petroleum products or other combustible materials.

6.6.8 Home workshops often contain conditions that foster fire propagation. These areas should be checked for possible hazards during the home visit.

6.6.9 Fire fighters should check the outside of the home for rubbish accumulations, defective electrical equipment, flammable liquid storage, or other hazards. On the perimeter walk with the occupant, storage at least 3 ft (1 m) from the home should be recommended. Recommendations should also be made to eliminate storage under decks, if applicable. Tree limbs should not overhang the home or touch the structure. Dryer vents and gas meter relief valves should be cleared of brush or vegetation. Any evidence of improper disposal of smoking materials should be pointed out to the occupant and corrected.

6.6.10 Fire fighters should be prepared to provide or recommend to the occupant specific information on home fire extinguishers and fire detection systems that conform to nationally accepted standards.

6.6.11 Hazardous chemicals (e.g., herbicides, pesticides, vehicle fluids, painting materials, swimming pool chemicals, cleaning fluids) are often found in the course of home visits, usually under sinks in bathrooms and kitchens and in garages, basements, or storage outbuildings. These materials can present an extreme danger to young children in the household and to fire fighters during a fire. The occupant should be advised to keep these materials in secure cabinets and to keep only the minimum amount actually needed. Many communities have scheduled pickup or disposal days for such materials. If so, the occupant should be advised about how to properly dispose of excess hazardous materials.

6.7 Fire Safety Precautions in Earthquake-Prone Areas.

6.7.1 Water heaters should be secured according to code requirements to prevent toppling.

6.7.2 Flammable liquids should not be placed on high shelves that allow the containers to fall and spill their contents on the floor.

6.7.3 Fire fighters should ask the occupant whether he or she knows the location of the main gas and water shutoffs and has the tools necessary to turn them off.

6.7.4 Fire fighters should determine whether the occupant keeps emergency supplies of food and water and knows the proper actions to take during and immediately after an earthquake.

6.8 Flammable Gases.

6.8.1 Fire fighters should be alert for containers of flammable gases (e.g., liquefied petroleum gas, acetylene) in workshop, basement, garage, and patio areas. Fire fighters should discuss with the occupant the safe handling and storage of such gases (including the recommendation that they not be stored in the home). The location of such materials should be noted on company pre-fire planning records.

6.8.2 The occupant should be advised to keep spare cylinders of flammable gases in a secure location outside the home.

6.8.3 If quantities of cylinders are found in excess of reasonable need, the danger should be discussed and the occupant encouraged to dispose of the excess in an acceptable manner.

Chapter 7 Life Safety Considerations

7.1 Exit and Escape Routes.

7.1.1 One of the fire protection weaknesses found in the average home is lack of sufficient exits from all parts of the building. For example, rooms on a second or third story or basements might be served by only an interior stairway; if a fire starts on the first floor, persons in these other areas can become trapped. Fire fighters should explain the need for the occupant to determine at least two routes of escape from each room.

7.1.2 Particular attention should be given to home windows that might be designated as secondary escape routes. Windows that are blocked by security bars or air-conditioning units or that are too small or too high above the floor for quick egress from the room are a potential for trouble in the event of a fire.

7.1.3 Because of security concerns, barriers (e.g., metal bars, shutters, or latticework) are sometimes found on doors and windows that are possible escape routes. Such devices should be installed with a method of quick release from the inside of the home during a fire emergency.

7.2 Fire Exit Drill Plan.

7.2.1 The occupant should be encouraged to develop a fire exit drill plan. In particular, family members should be instructed on how to escape from second-story windows, porches, and other parts of upper floors. Removal of windows and screens in emergencies and directing of young children to escape routes are essential to a good home fire exit drill plan.

7.2.2* All persons should know two ways out of every room in the home, if possible. A safe meeting place outside the home should be determined so that all family members can assemble in the event of evacuation.

7.2.3 Safe-escape training with children should be appropriate for their level of growth and development and be conducted with a parent present. If possible, the parents should be given proper instruction first, with follow-up practice afterward with the whole family.

7.3 Occupants with Special Needs.

7.3.1 Fire fighters should be alert to occupants with special needs (e.g., sight or hearing impairments, limited mobility). If an occupant has special needs, fire fighters should discuss evacuation routes and requirements in the event of a fire or other emergency. If possible, the sleeping area for an occupant with special needs should be located on the first floor near an accessible exit.

7.3.2 The use of stickers or decals on the exterior of the home to indicate the presence of invalids or children is discouraged for the following reasons:

(1) The home might be targeted for burglaries and break-ins.
(2) The fire department has no guarantee that the stickers are valid for current residents.
(3) A false sense of security can be created for the occupants of the home.
(4) The residents could be led to believe that, rather than install smoke alarms and establish a home fire escape plan and a means of escape, they should rely on the fire department for rescue during a fire.

7.3.3 Listing homes that have special fire fighting or other community risk considerations such as an invalid occupant might be acceptable for inclusion in dispatch information. Fire fighters have an excellent opportunity to collect such data while conducting community risk reduction home visits. Permanent stickers or decals providing emergency telephone numbers, such as 911 or other fire and life safety emergency numbers are an excellent public relations tool.

7.4 Smoke Alarms and Other Early Warning Devices.

7.4.1 The use of approved smoke alarms and other early warning devices should be emphasized in home visits. Statistics have proved the worth of such warning devices as life savers when they are combined with good escape planning practices. Many jurisdictions now require that residential smoke alarms and other early warning devices such as carbon monoxide (CO) detectors be installed in all new construction and, in an increasing number of cases, in existing structures. Home visits provide an excellent opportunity for the fire department to install smoke alarms where none exist.

7.4.2 Fire fighters should request that the occupant activate the test button on any smoke alarms encountered in the course of the home visit. Activation tests the internal circuitry of a smoke alarm and establishes that it has an adequate power supply. A sensing test should be conducted using a commercially available aerosol product. Special care should be taken with systems that are tied to a central station, and appropriate notification must be made before performing tests on such systems.

7.4.3 Fire fighters should be familiar with local laws and should be able to answer questions that pertain to the purchase, installation, and maintenance of smoke alarms, such as the following:

(1) Which type, which power supply, and how many are necessary?
(2) What is the cost?
(3) Where should they be placed, and how are they installed?
(4) How are they tested?
(5) What maintenance is necessary?

7.4.4 Installation of smoke alarm devices in residential homes should be in accordance with the manufacturer's recommendations and *NFPA 72*.

7.5 Poisons. Poison control precautions should be discussed with the occupant. The discussion could address secure storage of poisons and drugs, poison control center phone numbers, and activation of the local emergency medical system.

7.6 Carbon Monoxide Detectors. Effective, reasonably priced carbon monoxide detectors are available for installation in all homes. Fire fighters should take note of the existence of such detectors and discuss the test and battery replacement schedules with the occupant. The hazards associated with carbon monoxide and proper actions to be taken in case of an alarm should also be discussed, and fire fighters should recommend that the occupant or persons in authority install detectors in accordance with recommendations of the manufacturer and with NFPA 720.

Chapter 8 Fire-Extinguishing Equipment

8.1 Fire Extinguishers.

8.1.1 If no fire extinguisher is found in the course of a home visit, fire fighters should recommend that one be purchased and installed.

8.1.2 If fire extinguishers are encountered, fire fighters should check that the rating and classification are appropriate and that the units have the listing mark of a nationally recognized testing laboratory. If the extinguishers are single-use units, the fire fighters should check for expiration dates. Inspection tags on rechargeable extinguishers should be checked for up-to-date servicing.

8.1.3 Fire fighters should be able to answer questions such as the following pertaining to the purchase, installation, and maintenance of household fire extinguishers:

(1) Which kind, which rating, and how many are necessary?
(2) What is the cost?
(3) Where should they be placed, and how should they be mounted?
(4) How are they operated and tested, and what periodic maintenance is necessary?

8.1.4 Installation of portable fire extinguishers in residential buildings should be in accordance with NFPA 10.

8.2 Residential Automatic Fire Sprinkler Systems.

8.2.1 Fire sprinklers provide a level of protection that no other fire protection technology can offer. Like smoke alarms, sprinklers detect a fire, but they do even more. Fire sprinklers automatically respond to a fire while it is still small, controlling the spread of deadly heat, flames, and toxic smoke. Fire sprinklers are effective whether or not the residents have responded to the smoke alarm. Fire sprinklers make up for human error, and they provide a life-saving cushion for a time-consuming escape.

8.2.2 Automatic fire sprinkler systems are becoming more common in homes due to code changes and increased homeowner and occupant awareness. Fire fighters should be alert to

any conditions in the home, such as obstructions of sprinklers, that might impair the performance of the system during a fire. The homeowner or occupant should be requested to operate the water flow test connection in the presence of the fire fighters after appropriate notifications have been made to any central station alarm services.

8.2.3 In most settings where there is a municipal water supply, sprinklers operate off the household water main. Where the water supply is a well or there is not enough water pressure, a holding tank is used. Fire sprinklers are linked by a network of piping, typically hidden behind walls and ceilings. The high temperature of an early-stage fire [135°F–165°F (57°C–74°C)] causes the sprinkler to activate. Only this high heat initiates the sprinkler to flow water. (Neither smoke nor a smoke alarm activates a fire sprinkler.) Only the sprinkler closest to the fire operates, flowing water directly on the flames in the area of the fire's origin. This quick action controls or extinguishes the flames (often before the fire department arrives). Fire sprinklers slow the spread of deadly heat and toxic smoke, preventing flashover. This also provides residents with more time to escape safely.

8.2.4 Wet-pipe fire sprinkler systems can be installed in homes where freezing may occur. Several design options exist in NFPA 13D, including the use of proper insulation, heating of sprinkler piping areas, installing sprinkler piping in interior walls, and dry-pipe and pre-action systems.

Chapter 9 Wildland/Urban Interface Fire Safety

9.1 General. The increasing presence of homes in areas subject to wildland fire requires additional precautions for fire safety due to the exterior threat from fire, heat, and, especially, embers (firebrands). Homeowners and residents in those areas should take special measures to reduce the risk that their homes will be ignited by a rapidly spreading fire in vegetated areas. Often, occupants need to be educated about such precautions.

9.2 Precautions. Residents can most appropriately mitigate hazards within an area around the home (and adjacent structures) up to 200 ft (61 m) in radius. This area is known as the "structure ignition zone."

9.2.1 Precautions against ignition from wildfires within the structure ignition zone include, but are not necessarily limited to, the following:

(1) Maintaining a survivable space (buffer zone) of at least 30 ft (10 m) around the dwelling, especially the vegetation next to the home within the first 5 ft to 6 ft (1.5 m to 2 m) from the foundation
(2) Installing noncombustible roofs; The roof is most vulnerable to showers of embers (firebrands) that can be borne by winds from fires up to a mile away and blown into cracks and crevices that may exist between shingles and other structural assemblies.
(3) Maintaining roof and gutters clear of debris, such as pine needles and dead leaves
(4) Installing high-moisture, low-flammability, or drought-resistant plants near the dwelling
(5) Placing ¼ in. (6 mm) mesh metal screens over foundation and eave vents
(6) Enclosing sides of stilt foundations and decks to prevent the intrusion of embers (firebrands)
(7) Providing metal screens or spark arresters of ½ in. (13 mm) or smaller mesh on chimneys
(8) Providing access to emergency water supply sources (swimming pools, wells, ponds, lakes, and the like) for use by fire fighters
(9) Strictly obeying open burning regulations

9.2.2 Additional wildfire safety education information can be obtained from local, state, or national forestry agencies, and links to their websites and others can be found at www.firewise.org. In areas with specific problems of wildland/urban interface, the fire department should be familiar with NFPA 1144.

9.3 Emergency Evacuation Preparations. Fire fighters should recommend the residents take pre-fire preparations, including the following:

(1) Know the community plan for evacuation as provided by the fire department, including possible routes for leaving the community, locations of community shelters, or make preparations to stay in the home.
(2) Inventory home and possessions with photographic or videotape support.
(3) Store important documents, photographs, and valuables in a secure off-premises location such as a safe-deposit box.
(4) Select and mark a manageable number of treasured items to take along in the event of a wildfire evacuation.
(5) Maintain a small bag of personal care items that can be useful at an evacuation shelter.

Chapter 10 All-Hazards Education

10.1 General. Today, homeowners and residents have concern for more than fire hazards. All-hazards issues are constant questions that result in queries to fire departments for hazard mitigation, response, and recovery.

10.2 Emergency All-Hazards Evacuation Preparations. Fire fighters should recommend that residents make all-hazards evacuation preparations, including the following:

(1) Know the community plan for evacuation as provided by the fire department, including possible routes for leaving the community, locations of community shelters, or preparations needed to stay in the home
(2) Inventory home and possessions with photographic or videotape support
(3) Store important documents, photographs, and valuables in a secure off-premises location such as a safe-deposit box
(4) Select and mark a manageable number of treasured items to take along in the event of a wildfire evacuation
(5) Maintain a small bag of personal care items that can be useful at an evacuation shelter

10.3 All-Hazards Concerns. Relevant information should be provided for typical non–fire hazard queries that concern the following:

(1) Earthquake (including the hazards indicated in Section 6.7)
(2) Hurricane
(3) Tornado
(4) Flood
(5) Volcanoes
(6) Hazardous materials (including the hazards in Section 6.6)
(7) Public health/pandemic
(8) Terrorist incident
(9) Personal disaster preparedness techniques

(10) Extreme heat and cold
(11) Falls
(12) Choking, suffocation, and strangulation, especially among infants
(13) Poisoning
(14) Drowning
(15) Scalds and burns
(16) Firearms safety

10.4* Preparation. Firefighters should be prepared to provide basic all-hazards information, as applicable to the jurisdiction, when requested by the public.

Chapter 11 Home Visit Forms

11.1 General Information. To fully document the types of fire and life safety hazards in homes and to ensure complete coverage of the community, a system of reports and records should be established for the community risk reduction program. If an existing fire inspection program for other properties is available, the system can be expanded to include the home visits. The required information system might be as simple or as comprehensive as the local fire and life safety problems and situations dictate. The information should include the numbers and types of fire and life safety hazards discovered and locations visited. The information collected should be gathered for specific reasons if it is to be meaningful; for example, the number and type of fire and life safety hazards could be analyzed to determine the direction of public education efforts. It is desirable to retain home visit information by census tracts to create target populations while maintaining confidentiality for the homes visited.

11.2* Confidentiality of Results. The results of individual home visits should be retained carefully and held as confidential information by the fire department. Specific information relative to a home visit at a particular location should not be released to news media, insurance agents, commercial concerns, and so forth. Reports and home visit forms used in the program can be developed in the jurisdiction or obtained from other sources. Sample home visit forms are included in Annex A.

11.3 Retaining Results. The community risk reduction report should be filled out completely and follow a logical sequence from start to finish. It should be filled out in duplicate, with the original given to the occupant and the duplicate retained for department use in tabulating hazards in the community. The retained portion might or might not identify the specific residence, depending on whether there is concern regarding the report being classified as a public record, which is required to be made available to other persons on request or by subpoena.

11.4 Other Assistance. Another useful tool in a home visit program is an introductory letter from the community's mayor, city manager, or equivalent high official recommending cooperation with the fire department. Every effort should be made to provide information on and assistance with the installation of smoke alarms, carbon monoxide (CO) detectors, and residential sprinkler systems and the establishment of an escape plan and the importance of practicing it regularly.

11.5 Community Partnerships. Community partnerships are important for optimum success of a community risk reduction program. Community partnerships allow the fire department to meet common shared goals with other community organizations and help achieve broader reach with incentives that maximize efforts to gain widespread acceptance.

11.6 Program Evaluation. Evaluation of the community risk reduction program is a critical piece. The fire department should track changes to monitor the impact of the various program elements. The fire department should seek feedback from occupants through the use of evaluations to determine whether home visits were helpful in changing behaviors.

Annex A Explanatory Material

Annex A is not a part of the recommendations 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.1.2.1 Although American fire experiences vary year to year, the general impact of fire and fire incidences is well known by fire professionals. Because of growing population, aging buildings and infrastructure, and other demographic changes, the fire problem in America is still severe. The public might not realize the severity of the problem because losses most often do not occur in major disasters (e.g., World Trade Center attacks or the southern California wildfires) but in incidents of smaller local scale, which are indicators of the national problem. For example, according to NFPA, fire departments in the United States responded to an estimated 1,389,500 fires in 2011. These fires resulted in 3005 civilian fire fatalities, 17,500 civilian fire injuries, and an estimated $11.7 billion dollars in direct property loss. There was a civilian fire death every 175 minutes and a civilian fire injury every 30 minutes in 2011. Home fires caused 2,520, or 8.4 percent, of the civilian fire deaths. Fires accounted for five percent of the 30,098,000 total calls. Nine percent of the calls were false alarms; 66 percent of the calls were for aid such as EMS. (*See Fire Loss in the U.S. During 2011.*) Fire personnel will want to use the most current information available. For the most current data and information regarding the nation's fire experience, visit www.nfpa.org.

A.1.2.3 Each of these potential benefits help empower both the fire department and the community residents to engage in community risk reduction efforts to improve safety and reduce the burden on emergency services.

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 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 Community Risk Reduction (CRR). CRR integrates emergency response with prevention. CRR involves identifying and prioritizing risks, selecting and implementing strategies, monitoring and evaluating activities, and involving community partners, all in an effort to better protect residents and fire fighters.

A.3.3.4 Radon. When inhaled, radon gives off radioactive particles that can damage the cells that line the lung. Long-term exposure to radon can lead to lung cancer. Radon is the number one cause of lung cancer in nonsmokers and the number two cause of lung cancer in smokers.

A.3.3.6 Structure Ignition Zone. The "zone" includes the structures and their immediate [0-200 ft (0-60 m)] surroundings. Under some conditions, 100 ft (30 m) or less around structures may be enough distance to treat, while intense fire potential in heavier fuels may require the surroundings to extend to 200 ft (60 m) from the structure. The area and shape of the structure ignition zone is site-specific.

A.3.3.8 Wildland/Urban Interface. The term *wildland/urban interface* can distort the perception of the primary issue. It can direct attention to "where" structures are located (e.g., at the edge of communities near the wildland) rather than whether they are highly ignitible. A focus on "where" could result in a concern about things that won't make a big difference in reducing structure loss (i.e., how fire fighters and equipment get there, what type of fire equipment is needed, and the location of fire hydrants and water sources). How wide the roads are and where the fire hydrants are located become of little value if there are more structures at risk than equipment to protect them, or if it's too dangerous to safely be there with fire-fighting forces.

The essence of this issue is not "where" structures and domestic landscapes adjoin wildland, but the location, density, and availability of ignitible structures. Which structures are at the greatest risk: ignition-resistant homes bordering a wildland, or a dense subdivision with wood shingle roofs several miles away from wildland fuels? The wildland/urban interface is not geographic location but rather a set of conditions that may exist in many communities.

A.4.2 The installation of smoke alarms in homes occupied by high-risk residents provides an effective opportunity to increase the chances that the occupants would be able to evacuate a home successfully in the event of a fire. Programs to install smoke alarms in many communities in the country have a proven track record for reducing risk and increasing life safety. Smoke alarm installation programs should be reviewed by the agency's legal counsel to minimize any liability. The installation of smoke alarms by fire fighters who are trained in their proper placement, use, and maintenance will minimize any risk and will result in benefits that greatly outweigh any perceived risk to the authority having jurisdiction.

A.5.3.3 There are also many good sources for training information available on the Internet, such as the National Fire Academy through the U.S. Fire Administration and the National Fire Protection Association. The Safe Kids Training Academy provides free self-tutorial training on CO, smoke alarms, falls, safe escape, and other fire and life safety education books and information. The department might also consider ride-alongs with other safety professionals such as the gas and power company, HVAC, and electricians, and so forth, to gain a better insight to community risks.

A.5.5.6 Data gathered from residential visits should be collected and analyzed on the aggregate, not on an individual property basis. Homeowners and occupants want the assurance that information collected during a residential visit is protected.

A.6.3.3.1 Refer to NFPA 70A for specific requirements.

A.6.5.2.1 Refer to NFPA 54 for specific requirements.

A.7.2.2 The NFPA widely promotes its public education programs, including Fire Prevention Week, *Learn Not to Burn Preschool Program®*, Remembering When®, and *Ready for Risk Watch®*. Educational brochures are available from NFPA that can be provided to the occupants of the dwelling.

A.10.4 The information should be consistent with information provided by such agencies as the following:

(1) Federal Emergency Management Agency (www.fema.gov)
(2) National Fire Protection Association (www.nfpa.org)
(3) National Home Safety Council (www.homesafetycouncil.org)
(4) Home Fire Sprinkler Coalition (www.homefiresprinkler.org)
(5) State Emergency Management Agencies
(6) State homeland security agencies
(7) Centers for Disease Control and Prevention (www.cdc.gov)
(8) American Red Cross (www.redcross.org)

A.11.2 The sample forms in Figure A.11.2(a) through Figure A.11.2(d) are good examples of documents routinely used as parts of home fire and life safety programs and can be easily adapted by those fire departments planning to establish such a program.

Home Safety Survey Sheet
ANYTOWN Fire Department Fire Safety Education Program
Check to see whether any hazards exist in your home.

YES	NO	
❑	❑	No more than two appliances are being used with any single outlet or extension cord.
❑	❑	Outlets are not cracked or uncovered.
❑	❑	Extension cords are used appropriately.
❑	❑	Electrical cords are not under rugs.
❑	❑	Small appliances are unplugged when not in use.
❑	❑	Combustibles are removed from cooking areas.
❑	❑	Electrical cords are in good shape.
❑	❑	Wastepaper is properly disposed of.
❑	❑	Household chemicals are stored away from children.
❑	❑	Matches are out of reach of minors.
❑	❑	Large ashtrays are in every room where smoking may take place.
❑	❑	Flammable liquids are properly stored.
❑	❑	A smoke alarm is installed.

The items checked "No" may cause a fire or be hazardous to you and your family. You are urged to correct these at once for your own safety.

FIGURE A.11.2(a) Sample Home Safety Survey Sheet to Be Completed by Homeowner.

Fire Safety Survey
ANYTOWN Fire Department Fire Safety Education Program

YES	NO	
		General
❑	❑	Home has smoke alarm.
❑	❑	Smoke alarm is in working order.
❑	❑	Family has and practices an exit plan.
❑	❑	House numbers are visible from street.
		All Household Areas
❑	❑	Extension cords are used appropriately.
❑	❑	Electrical cords are in good shape.
❑	❑	There are no overloaded outlets.
❑	❑	Windows can be easily opened.
❑	❑	Wastepaper is properly disposed of.
❑	❑	Household chemicals are stored away from children.
❑	❑	Matches are out of reach of minors.
❑	❑	Large ashtrays are in every room where smoking may occur.
		Basement
❑	❑	Combustibles are removed from heating areas.
❑	❑	Furnace filters are clean and in good shape.
❑	❑	Fuse box does not have pennies.
❑	❑	Washer and dryer are properly grounded.
❑	❑	Clothes dryer lint collector is clean.
❑	❑	Basement door is closed.
		Kitchen
❑	❑	Combustibles are removed from cooking areas.
❑	❑	Small appliances are unplugged when not in use.
❑	❑	Kitchen hood vent is clean and maintained.
		Living Area
❑	❑	Fireplace has proper screen and hearth.
❑	❑	Chimney is clean, and ashes properly disposed of.
		Attic
❑	❑	Area is clear of all combustible materials.
❑	❑	Heating ducts are properly maintained.
		Garage
❑	❑	There is a solid core door between garage and residence.
❑	❑	Power mower is properly stored.
❑	❑	Flammable liquids are properly stored.

Remarks: _____

With your consent, the Fire Safety Survey Team has made a Fire Safety Survey of your home. The items checked "No" may cause a fire or be hazardous to you and your family. You are urged to correct these at once for your own safety. If all items have been checked "Yes," you are to be complimented on your personal fire prevention effort.
If you wish to discuss any hazard, or have any questions, please call the ANYTOWN Fire Department, Fire Safety Education Center at ###-####. You should know what to do in case of emergency.
For All Emergencies Call 911

FIGURE A.11.2(b) Sample Home Safety Survey Sheet to Be Completed by Fire Department Survey Team and Given to Homeowner.

ANYTOWN FIRE DEPARTMENT

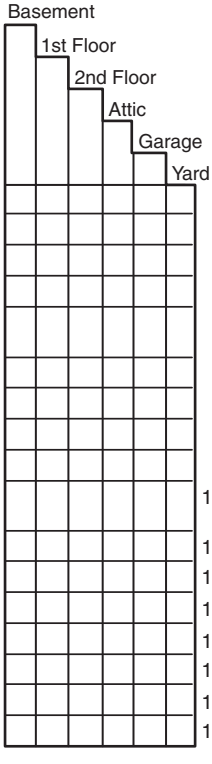
Home Inspection of number _____ St., Rd., Pl., Ave.

Dear Occupant:
With your consent, the undersigned fire department inspector has made a fire safety inspection of your home. The inspector has checked below those conditions that could start a fire and has left instructions on how to correct these fire hazards. YOU ARE URGED TO CORRECT THEM AT ONCE – please do not put it off. If you wish to discuss any hazard, please call the Fire Department – 555-5555.

(signed)

John Doe, Fire Chief.

_____ , 20 ____



1. Rubbish and trash accumulations.
2. Ashes improperly handled.
3. Flammable liquids improperly stored.
4. Painting materials, oily rags, unsafe.
5. Storage or work areas congested, not fire safe.
6. Combustibles too near heating devices.
7. Smokepipes and flues unsafely arranged.
8. Masonry chimneys unsafe.
9. Gas-fueled devices improperly arranged.
10. Electrical circuit overloading, improper fuses.
11. Electric cords and motors unsafe.
12. TV & radio sets poorly arranged.
13. Outbuilding and yard, cleanup needed.
14. Building maintenance fire safety.
15. Babysitter information.
16. Home fire extinguisher information.
17. NO DEFECTS NOTED. CONGRATULATIONS!

Type of heat used in home _____

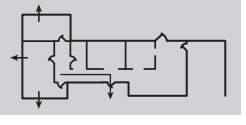
Number of home occupants ____ ; number of invalids ____ on ____ floor.

_____
Fire department inspector

FIGURE A.11.2(c) Sample Follow-up Correspondence from Fire Department to Homeowner.

Floor Plan

1. Use the grid to draw a floor plan of each person's bedroom or to show the whole house. Sample floor plans are on the back page.
2. Show two exits. Write down the outside meeting place.



Discuss procedures with your family.

1. Sleep with the bedroom door closed. It will hold back deadly smoke while you escape.
2. Plan on your alarm or some other signal to wake the family.
3. Test the door. If hot, use your alternative escape route. If cool, brace your shoulder against the door and open it cautiously. Be ready to slam it if smoke or heat rush in.
4. Crawl in smoke. Hold your breath, too.
5. Escape fast; don't stop to pack!
6. Choose a specific outdoor meeting spot so you can see that everyone is safe.
7. Assign somebody to make sure nobody returns to the burning house — Get Out! Stay Out!
8. Call the fire department from neighbor's phone.

Family Rehearsal

1. Everyone in bedrooms; doors closed.
2. One person sounds the alarm.
3. Each person tests his door.
4. Pretend it's hot; use alternative escape route.
5. Everyone meet outdoors at an assigned spot.

FIGURE A.11.2(d) Sample Grid Plan for Useful Dwelling Fire Safety Surveys.

Annex B Informational References

B.1 Referenced Publications. The documents or portions thereof listed in this annex are referenced within the informational sections of this guide and are not advisory in nature unless also listed in Chapter 2 for other reasons.

B.1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 54, *National Fuel Gas Code*, 2015 edition.

NFPA 70A, *National Electrical Code® Requirements for One- and Two-Family Dwellings*, 2005 edition.

Fire Loss in the U.S. During 2011, 2011.

B.2 Informational References. The following documents or portions thereof are listed here as informational resources only. They are not directly referenced in this guide.

B.2.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 72®, National Fire Alarm and Signaling Code, 2013 edition.

NFPA *101®*, *Life Safety Code®*, 2015 edition.

B.3 References for Extracts in Informational Sections. (Reserved)

Index

-A-

Administration ..... Chap. 1
Purpose 1.2
Scope 1.1
All-Hazards Education ..... Chap. 10
All-Hazards Concerns 10.3
Emergency All-Hazards Evacuation Preparations 10.2
General 10.1
Preparation 10.4, A.10.4
Approved
Definition 3.2.1, A.3.2.1
Authority Having Jurisdiction (AHJ)
Definition 3.2.2, A.3.2.2

-C-

Carbon Monoxide Detector
Definition 3.3.1
Common Hazards Found in Homes ..... Chap. 6
Careless Use of Candles, Smoking Materials, Matches, and Other Open-Flame Devices 6.2
Electrical Installations 6.3
Grounded Receptacles 6.3.3
Other Common Electrical Hazards Found in the Home ... 6.3.5
Outdoor Electrical Service 6.3.4
Overcurrent Protection 6.3.2
Violations and Hazards 6.3.1
Fire Safety Precautions in Earthquake-Prone Areas 6.7
Flammable Gases 6.8
Flammable Liquids 6.4
Other Flammable Liquid Hazards 6.4.2
Storage and Dispensing Practices 6.4.1
General 6.1
Heating Systems and Appliances 6.5
Cooking Appliances and Venting Systems 6.5.3
General Hazards 6.5.1
Other Heating Devices 6.5.4
Types of Heating Systems 6.5.2
Coal and Wood Furnaces 6.5.2.3
Fireplaces 6.5.2.4
Gas-Fueled Systems 6.5.2.1, A.6.5.2.1
Oil-Fired Systems 6.5.2.2
Housekeeping, Storage, and Rubbish Hazards 6.6
Community Risk Reduction (CRR)
Definition 3.3.2, A.3.3.2

-D-

Definitions ..... Chap. 3

-E-

Explanatory Material ..... Annex A

-F-

Fire-Extinguishing Equipment ..... Chap. 8
Fire Extinguishers 8.1
Residential Automatic Fire Sprinkler Systems 8.2

-G-

Guide
Definition 3.2.3

-H-

Home
Definition 3.3.3
Home Visit Forms ..... Chap. 11
Community Partnerships 11.5
Confidentiality of Results 11.2, A.11.2
General Information 11.1
Other Assistance 11.4
Program Evaluation 11.6
Retaining Results 11.3

-I-

Informational References ..... Annex B

-L-

Life Safety Considerations ..... Chap. 7
Carbon Monoxide Detectors 7.6
Exit and Escape Routes 7.1
Fire Exit Drill Plan 7.2
Occupants with Special Needs 7.3
Poisons 7.5
Smoke Alarms and Other Early Warning Devices 7.4

-P-

Planning the Community Risk Reduction Program ..... Chap. 5
Communications 5.6
Community Risk Reduction Procedures 5.5
General 5.1
General Procedures 5.7
Program Duration 5.4
Publicity 5.2
Training 5.3
Program Benefits ..... Chap. 4
Continuing Community Risk Reduction Programs 4.3
Material Distribution 4.1
Support of Other Programs 4.2, A.4.2

-R-

Radon
Definition 3.3.4, A.3.3.4
Referenced Publications ..... Chap. 2
General 2.1
NFPA Publications 2.2
Other Publications 2.3
References for Extracts in Advisory Sections 2.4

-S-

Should
Definition 3.2.4
Smoke Alarm
Definition 3.3.5
Structure Ignition Zone
Definition 3.3.6, A.3.3.6

-W-

Wildland Fire
Definition 3.3.7
Wildland/Urban Interface
Definition 3.3.8, A.3.3.8
Wildland/Urban Interface Fire Safety ..... Chap. 9
Emergency Evacuation Preparations 9.3
General 9.1
Precautions 9.2