NFPA® 1033

Standard for Professional Qualifications for Fire Investigator

2014 Edition

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

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Standard for

Professional Qualifications for Fire Investigator

2014 Edition

This edition of NFPA 1033, *Standard for Professional Qualifications for Fire Investigator*, was prepared by the Technical Committee on Fire Investigator Professional Qualifications and released by the Technical Correlating Committee on Professional Qualifications. It was issued by the Standards Council on May 28, 2013, with an effective date of June 17, 2013, and supersedes all previous editions.

This edition of NFPA 1033 was approved as an American National Standard on June 17, 2013.

Origin and Development of NFPA 1033

In 1972, the Joint Council of National Fire Service Organizations (JCNFSO) created the National Professional Qualifications Board (NPQB) for the fire service to facilitate the development of nationally applicable performance standards for uniformed fire service personnel. On December 14, 1972, the board established four technical committees to develop those standards using the National Fire Protection Association (NFPA) standards-making system. The initial committees addressed the following career areas: fire fighter, fire officer, fire service instructor, and fire inspector and investigator.

The original concept of the professional qualification standards as directed by the JCNFSO and the NPQB was to develop an interrelated set of performance standards specifically for the uniformed fire service. The various levels of achievement in the standards were to build upon each other within a strictly defined career ladder. In the late 1980s, revisions of the standards recognized that the documents should stand on their own merit in terms of job performance requirements for a given field. Accordingly, the strict career ladder concept was revised, except for the progression from fire fighter to fire officer, in order to allow civilian entry into many of the fields. These revisions facilitated the use of the documents by other than the uniformed fire services. The Committee on Fire Inspector and Investigator Professional Qualifications met and produced the first edition of NFPA 1031, *Professional Qualifications for Fire Inspector, Fire Investigator, and Fire Prevention Education Officer*. This document was adopted by the NFPA in May of 1977.

In 1986, the joint council directed the committee to develop separate documents for each of the job functions the original document addressed. This direction was coupled with the decision to remove the job of fire investigator from the strict career path previously followed and allow for civilian entry. The first edition of this new document, NFPA 1033, *Standard for Professional Qualifications for Fire Investigator*, was adopted by the NFPA in June of 1987.

In 1990, responsibility for the appointment of professional qualifications committees and the development of the professional qualifications standards was assumed by the NFPA. The Professional Qualifications Correlating Committee was appointed by the NFPA Standards Council and assumed the responsibility for coordinating the requirements of all of the documents in the professional qualifications system.

The NFPA Standards Council established the Technical Committee on Fire Investigator Professional Qualifications in 1990 to address the need for specific expertise in the area of fire investigation to review and revise the existing document. This committee completed a job task analysis and developed specific job performance requirements for the job of fire investigator.

The intent of the Technical Committee on Fire Investigator Professional Qualifications was to develop clear and concise job performance requirements that can be used to determine that an individual, when measured to the standard, possesses the skills and knowledge to perform as a fire investigator. These job performance requirements are applicable to fire investigators both public and private.

In the 2003 edition of the document, the Technical Committee made changes to bring it into conformance with the new *Manual of Style for NFPA Technical Committee Documents*.

In the 2009 edition of the document, the Technical Committee added an explanatory annex item to the Scope statement. The committee's intent was to clarify that the standard applies to all fire investigation, including outside, vehicle, and other fires that are not structural. The committee added a skills maintenance requirement to Chapter 1 and included more specific Requisite Knowledge statements to various JPRs.

For the 2014 edition, the fire investigator is expected to remain current on the topics listed in the general requirements section of the document by attending formal education courses, workshops, and seminars, and through professional publications and journals. While the technical committee views a high-school level education as a minimum, the fire investigator is expected to maintain up-to-date basic knowledge of topics already projected in the document, as well as knowledge of fire protection systems; evidence documentation, collection, and preservation; and electricity and electric systems. Definitions for *fire analysis*, *fire dynamics*, *fire investigation technology*, and *fire science* have been added. The technical committee has also made clarifications under the evidence collection and preservation section of the document.

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Committee Scope: This Committee shall have primary responsibility for the management of the NFPA Professional Qualifications Project and documents related to professional qualifications for fire service, public safety, and related personnel.

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Committee Scope: This Committee shall have primary responsibility for documents on professional qualifications required of fire investigators.

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Standard for

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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.

Changes other than editorial are indicated by a vertical rule beside the paragraph, table, or figure in which the change occurred. These rules are included as an aid to the user in identifying changes from the previous edition. Where one or more complete paragraphs have been deleted, the deletion is indicated by a bullet (•) between the paragraphs that remain.

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

Chapter 1 Administration

1.1* Scope. This standard identifies the minimum job performance requirements (JPRs) for fire investigators.

1.2* Purpose. The purpose of this standard shall be to specify the minimum job performance requirements for serving as a fire investigator in both the private and public sectors.

1.2.1 It is not the intent of this standard to restrict any jurisdiction from exceeding the minimum requirements.

1.2.2 Job performance requirements for each duty are the tasks an individual must be able to perform in order to successfully carry out that duty; however, they are not intended to measure a level of knowledge. Together, the duties and job performance requirements define the parameters of the job of fire investigator.

1.3 General.

1.3.1 The fire investigator shall be at least age 18.

1.3.2 The fire investigator shall have a high school diploma or equivalent.

1.3.3 The authority having jurisdiction shall conduct a thorough background and character investigation prior to accepting an individual as a candidate for certification as a fire investigator.

1.3.4 The job performance requirements for fire investigator shall be completed in accordance with established practices and procedures or as they are defined by law or by the authority having jurisdiction.

1.3.5* The job performance requirements found in this standard are not required to be mastered in the order they appear. Training agencies or authorities shall establish instructional priority and the training program content to prepare individuals to meet the job performance requirements of this standard.

1.3.6* Evaluation of job performance requirements shall be by individuals who are qualified and approved by the authority having jurisdiction.

1.3.7* The investigator shall have and maintain at a minimum an up-to-date basic knowledge of the following topics beyond the high school level:

(1) Fire science
(2) Fire chemistry
(3) Thermodynamics
(4) Thermometry
(5) Fire dynamics
(6) Explosion dynamics
(7) Computer fire modeling
(8) Fire investigation
(9) Fire analysis
(10) Fire investigation methodology
(11) Fire investigation technology
(12) Hazardous materials
(13) Failure analysis and analytical tools
(14) Fire protection systems
(15) Evidence documentation, collection, and preservation
(16) Electricity and electrical systems

1.3.8* The fire investigator shall remain current in the topics listed in 1.3.7 by attending formal education courses, workshops, and seminars and/or through professional publications and journals.

Chapter 2 Referenced Publications

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

2.2 NFPA Publications. (Reserved)

2.3 Other Publications.

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

2.4 References for Extracts in Mandatory Sections. (Reserved)

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary,* 11th edition, shall be the source for the ordinarily accepted 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 Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.4* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.5 Shall. Indicates a mandatory requirement.

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

3.2.7 Standard. A document, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and which is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the *Manual of Style for NFPA Technical Committee Documents*.

3.3 General Definitions.

3.3.1 Due Process. The compliance with the criminal and civil laws and procedures within the jurisdiction where the incident occurred.

3.3.2 Fire Analysis. The process of determining the origin, cause, development, responsibility, and, when required, failure analysis of a fire or explosion.

3.3.3 Fire Department. An organization providing rescue, fire suppression, and related activities. For the purposes of this standard, the term "fire department" includes any public, private, or military organization engaging in this type of activity.

3.3.4 Fire Dynamics. The detailed study of how chemistry, fire science, and the engineering disciplines of fluid mechanics and heat transfer interact to influence fire behavior.

3.3.5 Fire Investigation. The process of determining the origin, cause, and development of a fire or explosion.

3.3.6 Fire Investigation Technology. Applied technology subjects related to and used in fire investigation including, but not limited to, specialized knowledge and skills in documentation of the investigation, scene and evidence processing, and failure analysis and analytical tools.

3.3.7 Fire Investigator. An individual who has demonstrated the skills and knowledge necessary to conduct, coordinate, and complete a fire investigation.

3.3.8 Fire Science. The body of knowledge concerning the study of fire and related subjects (such as combustion, flame, products of combustion, heat release, heat transfer, fire and explosion chemistry, fire and explosion dynamics, thermodynamics, kinetics, fluid mechanics, fire safety) and their interaction with people, structures, and the environment.

3.3.9 Job Performance Requirement. A statement that describes a specific job task, lists the items necessary to complete the task, and defines measurable or observable outcomes and evaluation areas for the specific task.

3.3.10 Requisite Knowledge. Fundamental knowledge one must have in order to perform a specific task.

3.3.11 Requisite Skills. The essential skills one must have in order to perform a specific task.

3.3.12 Task. A specific job behavior or activity.

3.3.13 Tools.

3.3.13.1* *Investigator's Special Tools.* Tools of a specialized or unique nature that might not be required for every fire investigation.

3.3.13.2* *Standard Equipment and Tools.* Investigator's tools and equipment that every investigator must carry.

Chapter 4 Fire Investigator

4.1 General.

4.1.1* The fire investigator shall meet the job performance requirements defined in Sections 4.2 through 4.7.

4.1.2* The fire investigator shall employ all elements of the scientific method as the operating analytical process throughout the investigation and for the drawing of conclusions.

4.1.3* Because fire investigators are required to perform activities in adverse conditions, site safety assessments shall be completed on all scenes and regional and national safety standards shall be followed and included in organizational policies and procedures.

4.1.4* The fire investigator shall maintain necessary liaison with other interested professionals and entities.

4.1.5* The fire investigator shall adhere to all applicable legal and regulatory requirements.

4.1.6 The fire investigator shall understand the organization and operation of the investigative team within an incident management system.

4.2* Scene Examination. Duties shall include inspecting and evaluating the fire scene, or evidence of the scene, and/or conducting a comprehensive review of documentation generated during the examination(s) of the scene if the scene is no longer available, so as to determine the area or point of origin, source of ignition, material(s) ignited, and act or activity that brought the ignition source and materials together and to assess the subsequent progression, extinguishment, and containment of the fire.

4.2.1 Secure the fire ground, given marking devices, sufficient personnel, and special tools and equipment, so that unauthorized persons can recognize the perimeters of the investigative scene and are kept from restricted areas and all evidence or potential evidence is protected from damage or destruction.

(A) Requisite Knowledge. Fire ground hazards, types of evidence, and the importance of fire scene security, evidence preservation, and issues relating to spoliation.

(B) Requisite Skills. Use of marking devices.

4.2.2* Conduct an exterior survey, given standard equipment and tools, so that evidence is identified and preserved, fire damage is interpreted, hazards are identified to avoid injuries, accessibility to the property is determined, and all potential means of ingress and egress are discovered.

(A) Requisite Knowledge. The types of building construction and the effects of fire on construction materials, types of evidence commonly found in the perimeter, evidence preservation methods, the effects of fire suppression, fire behavior and spread, fire patterns, and a basic awareness of the dangers of hazardous materials.

(B) Requisite Skills. Ability to assess fire ground and structural condition, observe the damage from and effects of the fire, and interpret fire patterns.

4.2.3 Conduct an interior survey, given standard equipment and tools, so that areas of potential evidentiary value requiring further examination are identified and preserved, the evidentiary value of contents is determined, and hazards are identified in order to avoid injuries.

(A) Requisite Knowledge. The types of building construction and interior finish and the effects of fire on those materials, the effects of fire suppression, fire behavior and spread, evidence preservation methods, fire patterns, effects of building contents on fire growth, the relationship of building contents to the overall investigation, weather conditions at the time of the fire, and fuel moisture.

(B) Requisite Skills. Ability to assess structural conditions, observe the damage and effects of the fire, discover the impact of fire suppression efforts on fire flow and heat propagation, and evaluate protected areas to determine the presence and/or absence of contents.

4.2.4 Interpret fire patterns, given standard equipment and tools and some structural or content remains, so that each individual pattern is evaluated with respect to the burning characteristics of the material involved and in context and relationship with all patterns observed and the mechanisms of heat transfer that led to the formation of the pattern.

(A) Requisite Knowledge. Fire dynamics, fire development, and the interrelationship of heat release rate, form, and ignitibility of materials.

(B) Requisite Skills. Ability to interpret the effects of burning characteristics on different types of materials.

4.2.5 Interpret and analyze fire patterns, given standard equipment and tools and some structural or content remains, so that fire development is determined, methods and effects of suppression are evaluated, false origin area patterns are recognized, and all areas of origin are correctly identified.

(A) Requisite Knowledge. Fire behavior and spread based on fire chemistry, fire dynamics, and physics, fire suppression effects, building construction.

(B) Requisite Skills. Ability to interpret variations of fire patterns on different materials with consideration given to heat release rate, form, and ignitibility; distinguish impact of different types of fuel loads; evaluate fuel trails; and analyze and synthesize information.

4.2.6 Examine and remove fire debris, given standard equipment and tools, so that all debris is checked for fire cause evidence, potential ignition source(s) is identified, and evidence is preserved without investigator-inflicted damage or contamination.

(A) Requisite Knowledge. Basic understanding of ignition processes, characteristics of ignition sources, and ease of ignition of fuels; debris-layering techniques; use of tools and equipment during the debris search; types of fire cause evidence commonly found in various degrees of damage; and evidence-gathering methods and documentation.

(B) Requisite Skills. Ability to employ search techniques that further the discovery of fire cause evidence and ignition sources, use search techniques that incorporate documentation, and collect and preserve evidence.

4.2.7 Reconstruct the area of origin, given standard and, if needed, special equipment and tools as well as sufficient personnel, so that all protected areas and fire patterns are identified and correlated to contents or structural remains, items potentially critical to cause determination and photo documentation are returned to their prefire location, and the area(s) or point(s) of origin is discovered.

(A) Requisite Knowledge. The effects of fire on different types of material and the importance and uses of reconstruction.

(B) Requisite Skills. Ability to examine all materials to determine the effects of fire, identify and distinguish among different types of fire-damaged contents, and return materials to their original position using protected areas and fire patterns.

4.2.8* Inspect the performance of building systems, including detection, suppression, HVAC, utilities, and building compartmentation, given standard and special equipment and tools, so that a determination can be made as to the need for expert resources, an operating system's impact on fire growth and spread is considered in identifying origin areas, defeated and/or failed systems are identified, and the system's potential as a fire cause is recognized.

(A) Requisite Knowledge. Different types of detection, suppression, HVAC, utility, and building compartmentation such as fire walls and fire doors; types of expert resources for building systems; the impact of fire on various systems; common methods used to defeat a system's functional capability; and types of failures.

(B) Requisite Skills. Ability to determine the system's operation and its effect on the fire; identify alterations to, and failure indicators of, building systems; and evaluate the impact of suppression efforts on building systems.

4.2.9 Discriminate the effects of explosions from other types of damage, given standard equipment and tools, so that an explosion is identified and its evidence is preserved.

(A) Requisite Knowledge. Different types of explosions and their causes, characteristics of an explosion, and the difference between low- and high-order explosions.

(B) Requisite Skills. Ability to identify explosive effects on glass, walls, foundations, and other building materials; distinguish between low- and high-order explosion effects; and analyze damage to document the blast zone and origin.

4.3 Documenting the Scene. Duties shall include diagramming the scene, photographing, and taking field notes to be used to compile a final report.

4.3.1 Diagram the scene, given standard tools and equipment, so that the scene is accurately represented and evidence, pertinent contents, significant patterns, and area(s) or point(s) of origin are identified.

(A) Requisite Knowledge. Commonly used symbols and legends that clarify the diagram, types of evidence and patterns that need to be documented, and formats for diagramming the scene.

(B) Requisite Skills. Ability to sketch the scene, basic drafting skills, and evidence recognition and observational skills.

4.3.2* Photographically document the scene, given standard tools and equipment, so that the scene is accurately depicted and the photographs support scene findings.

(A) Requisite Knowledge. Working knowledge of high-resolution camera and flash, the types of film, media, and flash available, and the strengths and limitations of each.

(B) Requisite Skills. Ability to use a high-resolution camera, flash, and accessories.

4.3.3 Construct investigative notes, given a fire scene, available documents (e.g., prefire plans and inspection reports), and interview information, so that the notes are accurate, provide further documentation of the scene, and represent complete documentation of the scene findings.

(A) Requisite Knowledge. Relationship between notes, diagrams, and photos, how to reduce scene information into concise notes, and the use of notes during report writing and legal proceedings.

(B) Requisite Skills. Data-reduction skills, note-taking skills, and observational and correlating skills.

4.4 Evidence Collection/Preservation. Duties shall include using proper physical and legal procedures to identify, document, collect, and preserve evidence required within the investigation.

4.4.1 Utilize proper procedures for managing victims and fatalities, given a protocol and appropriate personnel, so that all evidence is discovered and preserved and the protocol procedures are followed.

(A) Requisite Knowledge. Types of evidence associated with fire victims and fatalities and evidence preservation methods.

(B) Requisite Skills. Observational skills and the ability to apply protocols to given situations.

4.4.2* Locate, document, collect, label, package, and store evidence, given standard or special tools and equipment and evidence collection materials, so that it is properly identified, preserved, collected, packaged, and stored for use in testing, legal, or other proceedings and examinations, ensuring cross-contamination and investigator-inflicted damage to evidentiary items is avoided and the chain of custody is established.

(A) Requisite Knowledge. Types of evidence, authority requirements, impact of removing evidentiary items on civil or criminal proceedings (exclusionary or fire-cause supportive evidence), types, capabilities, and limitations of standard and special tools used to locate evidence, types of laboratory tests available, packaging techniques and materials, and impact of evidence collection on the investigation.

(B) Requisite Skills. Ability to recognize different types of evidence and determine whether evidence is critical to the investigation.

4.4.3 Select evidence for analysis, given all information from the investigation, so that items for analysis support specific investigation needs.

(A) Requisite Knowledge. Purposes for submitting items for analysis, types of analytical services available, and capabilities and limitations of the services performing the analysis.

(B) Requisite Skills. Ability to evaluate the fire incident to determine forensic, engineering, or laboratory needs.

4.4.4 Maintain a chain of custody, given standard investigative tools, marking tools, and evidence tags or logs, so that written documentation exists for each piece of evidence and evidence is secured.

(A) Requisite Knowledge. Rules of custody and transfer procedures, types of evidence (e.g., physical evidence obtained at the scene, photos, and documents), and methods of recording the chain of custody.

(B) Requisite Skills. Ability to execute the chain of custody procedures and accurately complete necessary documents.

4.4.5 Dispose of evidence, given jurisdictional or agency regulations and file information, so that the disposal is timely, safely conducted, and in compliance with jurisdictional or agency requirements.

(A) Requisite Knowledge. Disposal services available and common disposal procedures and problems.

(B) Requisite Skills. Documentation skills.

4.5 Interview. Duties shall include obtaining information regarding the overall fire investigation from others through verbal communication.

4.5.1 Develop an interview plan, given no special tools or equipment, so that the plan reflects a strategy to further determine the fire cause and affix responsibility and includes a relevant questioning strategy for each individual to be interviewed that promotes the efficient use of the investigator's time.

(A) Requisite Knowledge. Persons who can provide information that furthers the fire cause determination or the affixing of responsibility, types of questions that are pertinent and efficient to ask of different information sources (first responders, neighbors, witnesses, suspects, and so forth), and pros and cons of interviews versus document gathering.

(B) Requisite Skills. Planning skills, development of focused questions for specific individuals, and evaluation of existing file data to help develop questions and fill investigative gaps.

4.5.2 Conduct interviews, given incident information, so that pertinent information is obtained, follow-up questions are asked, responses to all questions are elicited, and the response to each question is documented accurately.

(A) Requisite Knowledge. Types of interviews, personal information needed for proper documentation or follow-up, documenting methods and tools, and types of nonverbal communications and their meaning.

(B) Requisite Skills. Ability to adjust interviewing strategies based on deductive reasoning, interpret verbal and nonverbal communications, apply legal requirements applicable, and exhibit strong listening skills.

4.5.3 Evaluate interview information, given interview transcripts or notes and incident data, so that all interview data is individually analyzed and correlated with all other interviews, corroborative and conflictive information is documented, and new leads are developed.

(A) Requisite Knowledge. Types of interviews, report evaluation methods, and data correlation methods.

(B) Requisite Skills. Data correlation skills and the ability to evaluate source information (e.g., first responders and other witnesses).

4.6 Post-Incident Investigation. Duties shall include the investigation of all factors beyond the fire scene at the time of the origin and cause determination.

4.6.1 Gather reports and records, given no special tools, equipment, or materials, so that all gathered documents are applicable to the investigation, complete, and authentic; the chain of custody is maintained; and the material is admissible in a legal proceeding.

(A) Requisite Knowledge. Types of reports needed that facilitate determining responsibility for the fire (e.g., police reports, fire reports, insurance policies, financial records, deeds, private investigator reports, outside photos, and videos) and location of these reports.

(B) Requisite Skills. Ability to identify the reports and documents necessary for the investigation, implement the chain of custody, and organizational skills.

4.6.2 Evaluate the investigative file, given all available file information, so that areas for further investigation are identified, the relationship between gathered documents and information is interpreted, and corroborative evidence and information discrepancies are discovered.

(A) Requisite Knowledge. File assessment and/or evaluation methods, including accurate documentation practices, and requisite investigative elements.

(B) Requisite Skills. Information assessment, correlation, and organizational skills.

4.6.3 Coordinate expert resources, given the investigative file, reports, and documents, so that the expert's competencies are matched to the specific investigation needs, financial expenditures are justified, and utilization clearly furthers the investigative goals of determining cause or affixing responsibility.

(A) Requisite Knowledge. How to assess one's own expertise, qualification to be called for expert testimony, types of expert resources (e.g., forensic, CPA, polygraph, financial, human behavior disorders, and engineering), and methods to identify expert resources.

(B) Requisite Skills. Ability to apply expert resources to further the investigation by networking with other investigators to identify experts, questioning experts relative to their qualifications, and developing a utilization plan for use of expert resources.

4.6.4 Establish evidence as to motive and/or opportunity, given an incendiary fire, so that the evidence is supported by documentation and meets the evidentiary requirements of the jurisdiction.

(A) Requisite Knowledge. Types of motives common to incendiary fires, methods used to discover opportunity, and human behavioral patterns relative to fire-setting.

(B) Requisite Skills. Financial analysis, records gathering and analysis, interviewing, and interpreting fire scene information and evidence for relationship to motive and/or opportunity.

4.6.5* Formulate an opinion concerning origin, cause, or responsibility for the fire, given all investigative findings, so that the opinion regarding origin, cause, or responsibility for a fire is supported by the data, facts, records, reports, documents, and evidence.

(A) Requisite Knowledge. Analytical methods and procedures (e.g., hypothesis development and testing, systems analysis, time lines, link analysis, fault tree analysis, and data reduction matrixing).

(B) Requisite Skills. Analytical and assimilation skills.

4.7 Presentations. Duties shall include the presentation of findings to those individuals not involved in the actual investigations.

4.7.1* Prepare a written report, given investigative findings, documentation, and a specific audience, so that the report accurately reflects the investigative findings, is concise, expresses the investigator's opinion, contains facts and data that the investigator relies on in rendering an opinion, contains the reasoning of the investigator by which each opinion was reached, and meets the needs or requirements of the intended audience(s).

(A) Requisite Knowledge. Elements of writing, typical components of a written report, and types of audiences and their respective needs or requirements.

(B) Requisite Skills. Writing skills, ability to analyze information and determine the reader's needs or requirements.

4.7.2 Express investigative findings verbally, given investigative findings, notes, a time allotment, and a specific audience, so that the information is accurate, the presentation is completed within the allotted time, and the presentation includes only need-to-know information for the intended audience.

(A) Requisite Knowledge. Types of investigative findings, the informational needs of various types of audiences, and the impact of releasing information.

(B) Requisite Skills. Communication skills and ability to determine audience needs and correlate findings.

4.7.3 Testify during legal proceedings, given investigative findings, contents of reports, and consultation with legal counsel, so that all pertinent investigative information and evidence are presented clearly and accurately and the investigator's demeanor and attire are appropriate to the proceedings.

(A) Requisite Knowledge. Types of investigative findings, types of legal proceedings, professional demeanor requirements, and an understanding of due process and legal proceedings.

(B) Requisite Skills. Communication and listening skills and ability to differentiate facts from opinion and determine accepted procedures, practices, and etiquette during legal proceedings.

Annex A Explanatory Material

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

A.1.1 The intent of this standard applies to all fire investigation, including outside, wildland, vehicle, and structural fires.

A.1.2 See Annex B.

A.1.3.5 See Annex B.

A.1.3.6 Those responsible for conducting evaluations should have experience levels or qualifications exceeding those being evaluated or be certified as a fire investigator by an accredited agency, and be trained or qualified to conduct performance evaluations. The latter, for authorities having jurisdiction, can be based on instructor certification. Many agencies select specialists to evaluate various sections of Chapter 4, which the committee accepts as best practice.

A.1.3.7 Basic up-to-date information on these topics can be found in the current edition of NFPA 921. NFPA 921 is written on a basic level for competency in fire and explosion investigation and updated on a three-year cycle "to establish guidelines and recommendations for the safe and systematic investigation or analysis of fire and explosion incidents" and "is designed to produce a systematic, working framework or outline by which effective fire and explosion investigation and origin and cause analysis can be accomplished." As stated in NFPA 921, "[It] is not intended as a comprehensive scientific or engineering text. Although many scientific and engineering concepts are presented within the text, the user is cautioned that these concepts are presented at an elementary level and additional technical sources, training, and education may often need to be utilized in an investigation.... The documents or portions thereof listed in this [document] are referenced within this guide and shall be considered part of the requirements of this document."

A.1.3.8 Fire investigation technology and practices are changing rapidly. It is essential for an investigator's performance and knowledge to remain current. It is recommended that investigators be familiar with the technical information and procedural guidance presented in materials such as NFPA 921 and *Fire Protection Handbook*.

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.3.2.4 Listed. The means for identifying listed equipment may vary for each organization concerned with product evaluation; some organizations do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.

A.3.3.13.1 Investigator's Special Tools. Examples include heavy equipment, hydrocarbon detectors, ignitible liquid detection canine teams, microscopes, flash point testers, and so forth.

A.3.3.13.2 Standard Equipment and Tools. An investigator's standard equipment and tools include a high-resolution camera, flash, and film or media; a flashlight; a shovel; a broom; hand tools; a tape measure or other measuring device; safety clothing and equipment; and evidence collection equipment and supplies. Examples of safety clothing and equipment are found in the safety chapter of NFPA 921.

A.4.1.1 Job Performance Requirements (JPRs) are organized according to duties. Duties describe major job functions and result from a job task analysis. JPRs, in total, define the tasks that investigators must be able to perform to be qualified; however, it is not logical, nor the committee's intent, that each and every JPR be performed during each investigation. Rather, the investigator should correctly apply selected JPRs as related to the investigation demands or the individual responsibilities.

A.4.1.2 The basic methodology for fire investigation involves collecting data, then developing and testing hypotheses *(see the methodology chapter of NFPA 921)*. The methodology recommended is the scientific method. Key steps in the scientific method are as follows:

(1) Recognizing the need
(2) Defining the problem
(3) Collecting data
(4) Analyzing the data
(5) Developing the hypothesis
(6) Testing the hypothesis
(7) Selecting final hypothesis

Developing hypotheses is an ongoing process of data collection and evaluation that happens throughout the investigation. Hypotheses are generally developed and tested for evaluating fire spread and growth, evaluating the nature of fire patterns, and determining origin, cause, and responsibility.

Testing of hypotheses can be either experimental or cognitive. Ultimately, the hypotheses and conclusions reached are only as dependable as the data used or available. Each investigator must apply a level of confidence in that opinion. For additional information regarding evaluation methods see ASTM E 678, *Standard Practice for Evaluation of Scientific or Technical Data*.

A.4.1.3 For additional information concerning safety requirements or training, see applicable local, state, or federal occupational safety and health regulations and *Safety at Scenes of Fire and Related Incidents*.

A.4.1.4 Fire investigators are encouraged to interact with other professionals or organizations in their respective communities. The interaction is important for the effective transfer of information, which can be general, such as what is related in training seminars or journals, or specific to one particular incident.

A.4.1.5 It is understood that fire investigators with arrest powers, fire investigators without arrest powers, and private sector fire investigators can utilize this standard. The following is a

list of those legal and regulatory requirements that are critical within the fire investigation field. It is the responsibility of the AHJ to select those issues that are pertinent to its respective agency or organization. Those selected issues should then serve as the measurement criteria or training guideline for the AHJ.

Due process issues (stated in task terms) are as follows: Conduct search and seizure, conduct arrests, conduct interviews, maintain chain of custody, utilize criminal and civil statutes applicable to the situation, and interpret and utilize contract law and insurance law. Show due process of civil rights laws, privacy laws, the fair credit reporting act, laws of trespass and invasion of privacy, laws of libel and slander, laws of punitive damages and attorney-client privilege, rules of evidence including spoliation, and other laws applicable to the AHJ.

A.4.2 Documents reviewed when a scene is not otherwise available can include but not be limited to incident reports, notes, photographs, diagrams and sketches, evidence, witness statements, test results, laboratory reports, and other information that would assist in the determination of the origin and cause.

A.4.2.2 For additional information concerning safety requirements or training, see applicable local, state, or federal occupational safety and health regulations; *Safety at Scenes of Fire and Related Incidents*; IAAI *Fire Investigator Safety Checklist;* NFPA 472; *Hazardous Materials for Fire and Explosion Investigators: Guidelines and Procedures*; *Safety and Health Guidelines for Fire and Explosion Investigators*; and the safety chapter of NFPA 921.

A.4.2.8 Examples of tampered systems are fire doors propped open, sprinkler systems shut down, and detection systems disabled. Examples of system failures include construction features such as compartmentation or fire doors that do not confine a fire, sprinkler systems that do not control a fire, smoke control systems that do not function correctly, HVAC systems that do not perform adequately, and alarm systems that fail to provide prompt notification. It is always important to consider the design and intention of the system. Investigators should keep in mind the possibility that systems might not have failed to function, but rather, might have been overcome by the fire development.

A.4.3.2 The use of a high-resolution camera is highly recommended. The use of various video camera systems to supplement visual documentation can be utilized and is encouraged.

A.4.4.2 Fire investigators should determine and identify in advance what authority and specific need each may have to seize and hold item(s) considered to be evidence. Where such authority or need is lacking, items should not be seized.

For additional information regarding evidence collection methods, see ASTM E 860, *Standard Practice for Examining and Preparing Items that Are or May Become Involved in Criminal or Civil Litigation.*

For additional information regarding evidence collection methods, see ASTM E 1188, *Standard Practice for Collection and Preservation of Information and Physical Items by a Technical Investigator.*

A.4.6.5 For additional information regarding evaluation methods, see ASTM E 678, *Standard Practice for Evaluation of Scientific or Technical Data.*

A.4.7.1 For additional information regarding the contents of a written report and evaluation methods, see ASTM E 620, *Standard Practice for Reporting Opinions of Scientific or Technical Experts*, and ASTM E 678, *Standard Practice for Evaluation of Scientific or Technical Data.*

Annex B Explanation of the Standard and Concepts of JPRs

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

B.1 Explanation of the Standard and Concepts of Job Performance Requirements (JPRs). The primary benefit of establishing national professional qualification standards is to provide both public and private sectors with a framework of the job requirements for the fire service. Other benefits include enhancement of the profession, individual as well as organizational growth and development, and standardization of practices.

NFPA professional qualification standards identify the minimum JPRs for specific fire service positions. The standards can be used for training design and evaluation, certification, measuring and critiquing on-the-job performance, defining hiring practices, and setting organizational policies, procedures, and goals. (Other applications are encouraged.)

Professional qualification standards for a specific job are organized by major areas of responsibility defined as duties. For example, the fire fighter's duties might include fire suppression, rescue, and water supply; the public fire educator's duties might include education, planning and development, and administration. Duties are major functional areas of responsibility within a job.

The professional qualifications standards are written as JPRs. JPRs describe the performance required for a specific job. JPRs are grouped according to the duties of a job. The complete list of JPRs for each duty defines what an individual must be able to do in order to successfully perform that duty. Together, the duties and their JPRs define the job parameters; that is, the standard as a whole is a job description.

B.2 Breaking Down the Components of a JPR. The JPR is the assembly of three critical components. *(See Table B.2.)* These components are as follows:

(1) Task that is to be performed
(2) Tools, equipment, or materials that must be provided to successfully complete the task
(3) Evaluation parameters and/or performance outcomes

Table B.2 Example of a JPR

(1) Task	(1) Ventilate a pitched roof
(2) Tools, equipment, or materials	(2) Given an ax, a pike pole, an extension ladder, and a roof ladder
(3) Evaluation parameters and performance outcomes	(3) So that a 4 ft × 4 ft hole is created, all ventilation barriers are removed, ladders are properly positioned for ventilation, ventilation holes are correctly placed, and smoke, heat, and combustion by-products are released from the structure

B.2.1 The Task to Be Performed. The first component is a concise, brief statement of what the person is supposed to do.

B.2.2 Tools, Equipment, or Materials that Must Be Provided to Successfully Complete the Task. This component ensures that all individuals completing the task are given the same minimal tools, equipment, or materials when being evaluated. By listing these items, the performer and evaluator know what must be provided in order to complete the task.

B.2.3 Evaluation Parameters and/or Performance Outcomes. This component defines how well one must perform each task — for both the performer and the evaluator. The JPR guides performance toward successful completion by identifying evaluation parameters and/or performance outcomes. This portion of the JPR promotes consistency in evaluation by reducing the variables used to gauge performance.

In addition to these three components, the JPR contains requisite knowledge and skills. Just as the term *requisite* suggests, these are the necessary knowledge and skills one must have to be able to perform the task. Requisite knowledge and skills are the foundation for task performance.

Once the components and requisites are put together, the JPR might read as follows.

B.2.3.1 Example 1. The Fire Fighter I shall ventilate a pitched roof, given an ax, a pike pole, an extension ladder, and a roof ladder, so that a 4 ft × 4 ft hole is created, all ventilation barriers are removed, ladders are properly positioned for ventilation, and ventilation holes are correctly placed.

(A) Requisite Knowledge. Pitched roof construction, safety considerations with roof ventilation, the dangers associated with improper ventilation, knowledge of ventilation tools, the effects of ventilation on fire growth, smoke movement in structures, signs of backdraft, and the knowledge of vertical and forced ventilation.

(B) Requisite Skills. The ability to remove roof covering; properly initiate roof cuts; use the pike pole to clear ventilation barriers; use an ax properly for sounding, cutting, and stripping; position ladders; and climb and position self on ladder.

B.2.3.2 Example 2. The Fire Investigator shall interpret fire patterns, given standard equipment and tools and some structural/content remains, so that each individual pattern is evaluated with respect to the burning characteristics of the material involved.

(A) Requisite Knowledge. Knowledge of fire development and the interrelationship of heat release rate, form, and ignitibility of materials.

(B) Requisite Skills. The ability to interpret the effects of burning characteristics on different types of materials.

B.3 Examples of Potential Uses.

B.3.1 Certification. JPRs can be used to establish the evaluation criteria for certification at a specific job level. When used for certification, evaluation must be based on the successful completion of JPRs.

First, the evaluator would verify the attainment of requisite knowledge and skills prior to JPR evaluation. This might be through documentation review or testing.

Next, the candidate would be evaluated on completing the JPRs. The candidate would perform the task and be evaluated based on the evaluation parameters and/or performance outcomes. This performance-based evaluation canbe eitherpractical (for psychomotor skills such as "ventilate a roof") or written (for cognitive skills such as "interpret fire patterns").

Note that psychomotor skills are those physical skills that can be demonstrated or observed. Cognitive skills (or mental skills) cannot be observed but are evaluated on how one completes the task (process-oriented) or on the task outcome (product-oriented).

Using Example 1, a practical performance-based evaluation would measure the ability to "ventilate a pitched roof." The candidate passes this particular evaluation if the standard was met — that is, a 4 ft × 4 ft hole was created, all ventilation barriers were removed, ladders were properly positioned for ventilation, ventilation holes were correctly placed, and smoke, heat, and combustion by-products were released from the structure.

For Example 2, to evaluate the task "interpret fire patterns," the candidate could be given a written assessment in the form of a scenario, photographs, and drawings and then be asked to respond to specific written questions related to the JPR's evaluation parameters.

Remember, when evaluating performance, you must give the candidate the tools, equipment, or materials (e.g., an ax, a pike pole, an extension ladder, and a roof ladder) listed in the JPRs before he or she can be properly evaluated.

B.3.2 Curriculum Development/Training Design and Evaluation. The statements contained in this document that refer to job performance were designed and written as JPRs. While a resemblance to instructional objectives might be present, these statements should not be used in a teaching situation until after they have been modified for instructional use.

JPRs state the behaviors required to perform specific skill(s) on the job as opposed to a learning situation. These statements should be converted into instructional objectives with behaviors, conditions, and standards that can be measured within the teaching/learning environment. A JPR that requires a fire fighter to "ventilate a pitched roof" should be converted into a measurable instructional objective for use when teaching the skill. *[See Figure B.3.2(a).]*

Using Example 1, a terminal instructional objective might read as follows.

The learner will ventilate a pitched roof, given a simulated roof, an ax, a pike pole, an extension ladder, and a roof ladder, so that 100 percent accuracy is attained on a skills checklist. (At a minimum, the skills checklist should include each of the measurement criteria from the JPR.)

Figure B.3.2(b) is a sample checklist for use in evaluating this objective.

While the differences between job performance requirements and instructional objectives are subtle in appearance, the purpose of each statement differs greatly. JPRs state what is necessary to perform the job in the "real world." Instructional objectives, however, are used to identify what students must do at the end of a training session and are stated in behavioral terms that are measurable in the training environment.

By converting JPRs into instructional objectives, instructors will be able to clarify performance expectations and avoid confusion related to using statements designed for purposes other than teaching. Additionally, instructors will be able to add local/state/regional elements of performance into the standards as intended by the developers.

Requisite skills and knowledge should be converted into enabling objectives. The enabling objectives help to define the course content. The course content should include the

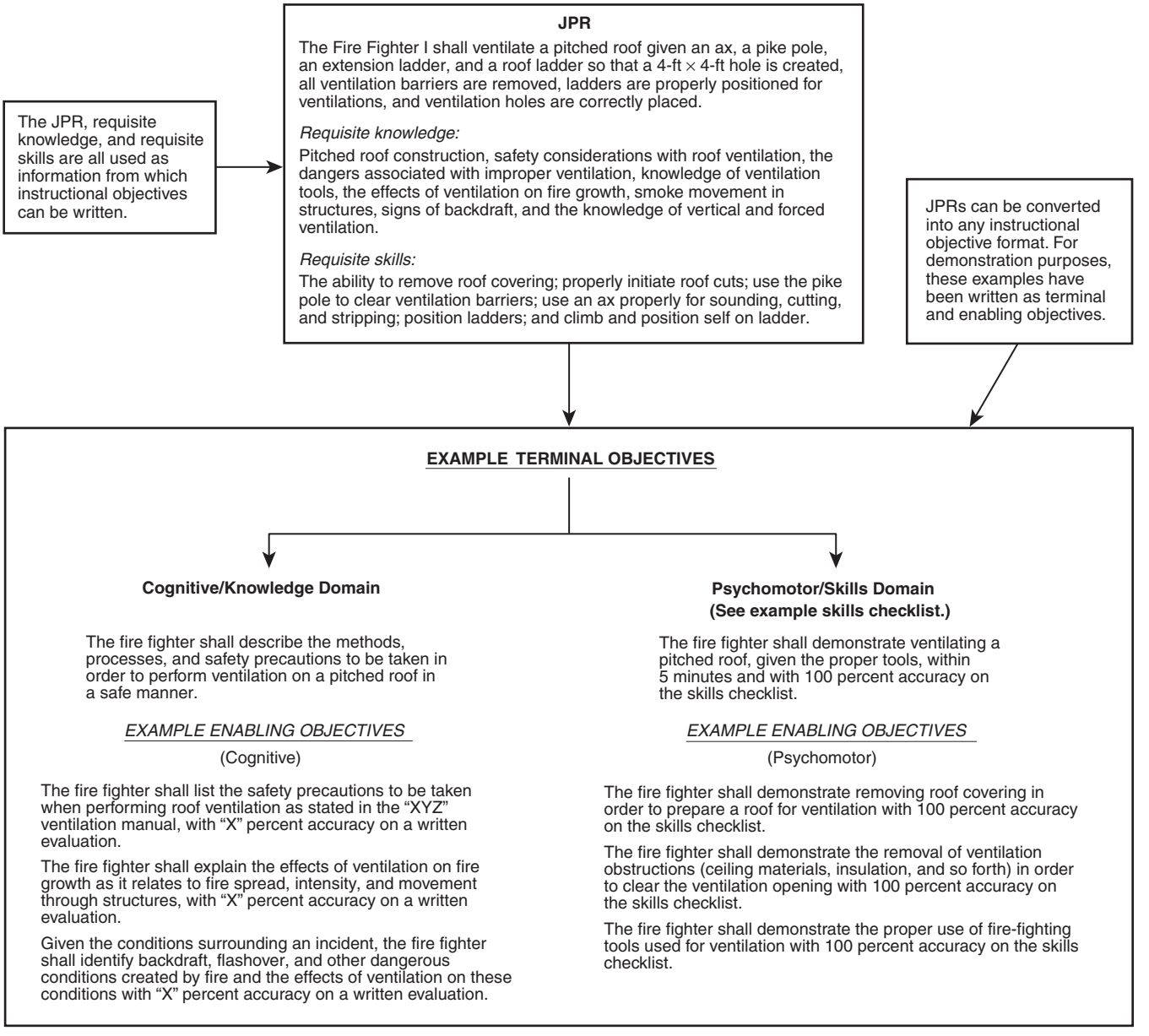

FIGURE B.3.2(a) Converting JPRs into Instructional Objectives.

requisite knowledge and skills. Using Figure B.3.2(b) as an example, the enabling objectives are pitched roof construction, safety considerations with roof ventilation, removal of roof covering, properly initiated roof cuts, and so forth. These enabling objectives ensure that the course content supports the terminal objective.

Note that it is assumed that the reader is familiar with curriculum development or training design and evaluation.

B.4 Other Uses. While the professional qualifications standards are principally used to guide the development of training and certification programs, there are a number of other potential uses for these documents. Because the documents are written in JPR terms, they lend themselves well to any area of the profession where a level of performance or expertise must be determined.

OBJECTIVE: The fire fighter shall demonstrate ventilating a pitched roof, given the proper tools, within 5 minutes and with 100 percent accuracy on the skills checklist.

YES	NO	
❑	❑	1. 4-ft × 4-ft hole was created.
❑	❑	2. All ventilation barriers were removed.
❑	❑	3. Ladders were properly positioned.
❑	❑	4. Ventilation holes were correctly placed (directly over fire, at highest point, and so forth).
❑	❑	5. The task was completed within 5 minutes. (Time to complete task: _____)

FIGURE B.3.2(b) Skills Checklist.

These areas might include the following:

(1) *Employee Evaluation/Performance Critiquing.* The JPRs can be used as a guide by both the supervisor and the employee during an evaluation. The JPRs for a specific job define tasks that are essential to perform on the job as well as the evaluation criteria to measure when those tasks are completed.
(2) *Establishing Hiring Criteria.* The professional qualifications standards can be used in a number of ways to further the establishment of hiring criteria. The AHJ could simply require certification at a specific job level (e.g., Fire Fighter I). The JPRs could also be used as the basis for pre-employment screening by establishing essential minimal tasks and the related evaluation criteria. An added benefit is that individuals interested in employment can work toward the minimal hiring criteria at local colleges.
(3) *Employee Development.* The professional qualifications standards can be useful to both the employee and the employer in developing a plan for an individual's growth within an organization. The JPRs and the associated requisite knowledge and skills can be used as a guide to determine additional training and education required for the employee to master the job or profession.
(4) *Succession Planning.* Succession planning or career pathing addresses the efficient placement of people into jobs in response to current needs and anticipated future needs. A career development path can be established for targeted individuals to prepare them for growth within an organization. The JPRs and requisite knowledge and skills can then be used to develop an educational path to aid in the individual's advancement within the organization or profession.
(5) *Establishing Organizational Policies, Procedures, and Goals.* The JPRs can be incorporated into organizational policies, procedures, and goals where employee performance is addressed.

Annex C Informational References

C.1 Referenced Publications. The documents or portions thereof listed in this annex are referenced within the informational sections of this standard and are not part of the requirements of this document unless also listed in Chapter 2 for other reasons.

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

NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, 2013 edition.

NFPA 921, *Guide for Fire and Explosion Investigations*, 2011 edition.

Fire Protection Handbook, 20th edition.

C.1.2 Other Publications.

C.1.2.1 ASTM Publications. ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM E 620, *Standard Practice for Reporting Opinions of Scientific or Technical Experts,* 2004.

ASTM E 678, *Standard Practice for Evaluation of Scientific or Technical Data,* 2007.

ASTM E 860, *Standard Practice for Examining and Preparing Items That Are or May Become Involved in Criminal or Civil Litigation,* 2007.

ASTM E 1188, *Standard Practice for Collection and Preservation of Information and Physical Items by a Technical Investigator,* 2011.

C.1.2.2 IAAI Publications. International Association of Arson Investigators, 2111 Baldwin Avenue, Suite 203, Crofton, MD 21114.

Fire Investigator Safety Checklist, 1997.

C.1.2.3 IFSTA Publications. International Fire Service Training Association, 930 North Willis, Stillwater, OK 74078-8045.

Hazardous Materials for Fire and Explosion Investigators: Guidelines and Procedures, 1998.

Safety and Health Guidelines for Fire and Explosion Investigators, 2002.

C.1.2.4 Other Publications.

Munday, J. W., *Safety at Scenes of Fire and Related Incidents.* London: Fire Protection Association, 1994.

C.2 Informational References. The following documents or portions thereof are listed here as informational resources only. They are not a part of the requirements of this document. These references apply to Annex B material.

Boyatzis, R. E., *The Competent Manager: A Model for Effective Performance.* New York: John Wiley & Sons, 1982.

Castle, D. K., "Management Design: A Competency Approach to Create Exemplar Performers." *Performance and Instruction* 28:1989; 42–48.

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Gilley, J. W., and Eggland, S. A., *Principles of Human Resource Development.* Reading, MA: Addison-Wesley, 1989.

Hooton, J., *Job Performance = Tasks + Competency × Future Forces.* Unpublished manuscript, Vanderbilt University, Peabody College, Nashville, TN, 1990.

McLagan, P. A., "Models for HRD Practice." *Training & Development Journal.* Reprinted, 1989.

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

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