NFPA 1033
2014 EDITION
OVERVIEW

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THE VIEWS EXPRESSED DURING THIS PRESENTATION ARE SOLELY THOSE OF THE PRESENTER AND DO NOT REPRESENT THE VIEWS OF NFPA OR THE 921 COMMITTEE
The History of 1033

1972  The National Professional Qualifications Board was established to develop a set of performance standards for the fire service.

1977  NFPA 1031 Professional Qualifications for Fire Inspector, Fire Investigator and Fire Prevention Education Officer

The History of 1033

1986  The council directed that separate documents be developed for each job function.

1987  The first edition of NFPA 1033 was published.

1990  Standards Council established the Technical Committee on Fire Investigator Professional Qualifications.

NFPA 1033


2009 Edition

1990  Standards Council established the Technical Committee on Fire Investigator Professional Qualifications.
1.1 – This standard shall identifies the minimum professional level of job performance requirements for Fire Investigators.

1.2 – The purpose of this standard shall be to specify the minimum job performance requirements for service serving as a fire investigator in both the private and public sectors.
CHAPTER 1

In addition to scope and purpose, 1.3 lays out the general requirements to be a fire investigator.

1.3 GENERAL

LISTS 8 REQUIREMENTS

1. Shall be at least 18 years old
2. Shall have a high school diploma

1.3.3 GENERAL

LISTS 8 REQUIREMENTS

3. 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 GENERAL
LISTS 8 REQUIREMENTS

4. JPR's shall be completed in accordance with established practices and procedures or as they are defined by law or the AHJ.

1.3.5 GENERAL
LISTS 8 REQUIREMENTS

5. The JPR's listed are not required to be mastered in the order they appear.

1.3.6 GENERAL
LISTS 8 REQUIREMENTS

6. Evaluation of JPR's shall be by individuals who are qualified and approved by the AHJ.
1.3.78 GENERAL
LISTS 8 REQUIREMENTS

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

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1.3.87 GENERAL
LISTS 8 REQUIREMENTS

7. The investigator shall have and maintain, at a minimum, an up-to-date basic knowledge of the following topics beyond a high school level at a post-secondary education level:

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1. Fire Science
2. Fire Chemistry
3. Thermodynamics
4. Thermometry
5. Fire Dynamics
6. Explosion Dynamics
7. Computer Fire Modeling
1.3.87 GENERAL
LISTS 8 REQUIREMENTS

8. Fire Investigation
9. Fire Analysis
10. Fire Investigation Methodology
11. Fire Investigation Technology
12. Hazardous Materials
13. Failure analysis and analytical tools

1.3.87 GENERAL
LISTS 8 REQUIREMENTS

14. Fire Protection Systems
15. Evidence Documentation, Collection, and Preservation
16. Electricity and Electrical Systems

1.3.7 GENERAL

New Annex material added

A1.3.7
A discussion of how basic up-to-date information on these topics can be found in the current edition of NFPA 921.
1. FIRE SCIENCE

- NFPA 921 3.3.67 Definition: 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.

- NFPA 921 Chapter 5 Basic Fire Science: Whole chapter addresses this issue.

- Section 5.1.1: “The fire investigator should have a basic understanding of ignition and combustion principles and should be able to use them to help in interpretation of evidence at the fire scene and in the development of conclusions regarding the origin and causes of the fire.”

2. FIRE CHEMISTRY

- 5.2.1 Defines Fire Chemistry: “The study of chemical processes that occur in fire, including changes of state, decomposition, and combustion.”

- The remaining subsections discuss these various components.

3. THERMODYNAMICS

- Webster's defines this as: “Physics involving the relations of heat with mechanical forms of energy.”

- The following sections discuss this topic:
  - 5.5 Heat Transfer
  - 5.6.3 Heat Release Rate
  - 5.6.4.5 Flame Height
4. THERMOMETRY

5.5.5 Thermometry.
Thermometry is the study of the science, methodology, and practice of temperature measurement. Though thermometry is seldom, if ever, needed at the fire scene, it is frequently used during postscene analysis, or in cases of fire safety or code compliance, in which the various physics or thermodynamic formulae present themselves.

5. FIRE DYNAMICS

- 3.3.61 Defines 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.”
- Chapter 5 Basic Fire Science discusses principles related to fire dynamics.
- Chapter 6 Fire Patterns discusses principles related to fire pattern development which is a component of fire dynamics.
- 17.2.1.2: “Fire spread scenarios within a compartment or building should be analyzed using principles of fire dynamics presented in Chapter 5 (Basic Fire Science) and fire pattern development in Chapter 6 (Fire Patterns)."

6. EXPLOSION DYNAMICS

Chapter 21 Explosions discusses all aspects of explosion dynamics with explanations of types of explosions, various categories of damage and various effects.
7. COMPUTER FIRE MODELING

Section 20.4 discusses “Mathematical Modeling”. This has various forms and addresses many aspects, such as: heat transfer analysis, flammable gas concentrations, hydraulic analysis, thermodynamic chemical equilibrium analysis, structural analysis, egress analysis, fire dynamics analysis, specialized fire dynamics routines, zone models and field, and computational fluid dynamic models.

8. FIRE INVESTIGATION

- Section 3.3.59 Definition: “The process of determining the origin, cause and development of a fire or explosion.”
- All of NFPA 921 is dedicated to this topic.

9. FIRE ANALYSIS

Section 3.3.59 Definition: “The process of determining the origin, cause, development, responsibility, and when required, a failure analysis of the fire or explosion.”

Like number eight, most of NFPA 921 is dedicated to this topic.
10. FIRE INVESTIGATION METHODOLOGY

Chapter 4 Basic Methodology discusses the Scientific Method and Systematic Approach. The Scientific Method is the methodology that courts around the country are referencing as they evaluate expert testimony in Daubert and similar motions to exclude or limit.

11. 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.

Added to the definitions of 1033

11. FIRE INVESTIGATION TECHNOLOGY

- All of NFPA 921 discusses the technology of fire investigation.
- Sections such as 17.4.3.2 (Measuring Depth of Char) and 20.4 (Computer Modeling) are just examples of specific technology discussed.
12. HAZARDOUS MATERIAL

- Chapter 12 Safety discusses various aspects of Hazardous Material.

- NFPA 471 and 472 are specific documents that also address this topic.

13. Failure Analysis and Analytical Tools

Chapter 20 is dedicated to this specific topic. This chapter addresses such topics as timelines, system analysis, mathematical modeling and fire tests.
14. Fire Protection Systems

A new chapter is being added to NFPA 921 on Fire Protection Systems for the 2014 Edition

2014 EDITION OF 921
(November 2013)

Chapter 8 Fire Protection Systems

This chapter provides a basic understanding of active fire protection systems, which includes general information, key components, operational and installation parameters, data gathering, and analysis. Passive fire protection systems are addressed in chapter 7. It is important to have a basic knowledge of fire protection systems and their performance during an incident, in order to understand the role of the system and potential impact on the fire.
15. Evidence Documentation, Collection, and Preservation

Chapter 15 Documentation of the investigation
Chapter 16 Physical Evidence

Many other chapters discuss documentation of various evidence related issues.

Issues such as:
- Photographs
- Diagrams
- Measurements
- Labeling
- Packaging
- Chain of Custody
- Spoliation

16. Electricity and Electrical Systems

Chapter 8 Electricity and Fire

Chapter 24 Appliances
ELECTRICITY

"Electricity" is defined by the dictionary as:

A physical agency caused by the motion of electrons, protons and other charged particles, manifesting itself as attraction, repulsion, magnetic, luminous and heating effects, etc...

This definition sounds like it was written by a lawyer.
IDENTIFY COMPONENTS

JOB PERFORMANCE REQUIREMENTS (JPR’S)

DEFINED:
“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.”

REQUISITE KNOWLEDGE

Fundamental knowledge one must have in order to perform a specific task.
REQUISITE SKILLS
The essential skills one must have in order to perform a specific task.

NEW DEFINITIONS ADDED
• Fire Analysis
• Fire Dynamics
• Fire Science
• Fire Investigation Technology

Most definitions are from NFPA 921

CHAPTER 4
FIRE INVESTIGATOR
• DIVIDED INTO 7 MAJOR SECTIONS
• SECTION 1 IS GENERAL
• SECTIONS 2 THROUGH 7 HAVE THREE BASIC PARTS:
  1. THE ACTIVITY
  2. REQUISITE KNOWLEDGE
  3. REQUISITE SKILL
7 SECTIONS OF CHAPTER 4

1. GENERAL
2. SCENE EXAMINATION
3. DOCUMENTING THE SCENE
4. EVIDENCE COLLECTION / PRESERVATION
5. INTERVIEW
6. POST-INCIDENT INVESTIGATION
7. PRESENTATIONS

4.1 GENERAL

• 4.1.1 THE INVESTIGATOR SHALL MEET THE JPR'S AS DEFINED IN 4.2 THROUGH 4.7.

• 4.1.2 SHALL EMPLOY ALL ELEMENTS OF THE SCIENTIFIC METHOD AS THE OPERATING ANALYTICAL PROCESS THROUGHOUT THE INVESTIGATION AND FOR THE DRAWING OF CONCLUSIONS.

A.4.1.2 (ANNEX ITEM CHANGE)

7) SELECT FINAL HYPOTHESIS (This was added to the list)
THE FUNDAMENTAL PREMISE OF FIRE INVESTIGATION:
"THE SCIENTIFIC METHOD"

OVERALL METHODOLOGY

Scientific Method
1. Recognize the need (identify the problem)
2. Define the project
3. Collect data
4. Analyze the data
5. Develop a hypothesis (inductive reasoning)
6. Test the hypothesis (deductive reasoning)
7. Select final hypothesis

Figure 17.2
Figure 18.2

4/6/2014
Example of Applying the Scientific Method to Crime Determination

Recognize the Need

Define the Problem

Collect Data

Analyse Data

Develop a Hypothesis

Test the Hypothesis

Select Final Hypothesis

Example of Applying the Scientific Method to Crime Determination

Recognize the Need

Define the Problem

Collect Data

Analyse Data

Develop a Hypothesis

Test the Hypothesis

Select Final Hypothesis

Example of Applying the Scientific Method to Crime Determination

Recognize the Need

Define the Problem

Collect Data

Analyse Data

Develop a Hypothesis

Test the Hypothesis

Select Final Hypothesis
4.2 SCENE EXAMINATION

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

Documents reviewed when the scene is not otherwise available may include but not 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.
4.2 SCENE EXAMINATION

4.2.1 Secure the fire ground
4.2.2 Conduct exterior survey
4.2.3 Conduct interior survey
4.2.4 Interpret fire patterns
4.2.5 Interpret and analyze fire patterns
4.2.6 Examine and remove fire debris
4.2.7 Reconstruct the area of origin
4.2.8 Inspect the performance of building systems
4.2.9 Discriminate the effects of explosions from other types of damage

4.2.2 Conduct exterior survey

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.

4.2.4 Interpret fire patterns

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 characteristic of the material involved; and each pattern evaluated in context and relationship with all patterns observed and the mechanisms of heat transfer that lead to the formation of the pattern.
4.3 DOCUMENTING THE SCENE

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

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4.3 DOCUMENTING THE SCENE

4.3.1 Diagram the scene
4.3.2 Photographically document the scene
4.3.3 Constructive investigative notes

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4.3 DOCUMENTING THE SCENE

4.3.1 Diagram the scene

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.
DRAWINGS & DIAGRAMS
(NFPA 921 Section 15.4)

- Clear and concise
- Assist the investigator
- Provide support and detail
- Assist with interviews

*Should be prepared in all cases that are expected to be involved in litigation!*

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4.3 DOCUMENTING THE SCENE

4.3.2 Photographically document the scene

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

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4.3 DOCUMENTING THE SCENE

4.3.3 Constructive investigative notes

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 finding.
WHAT DO I DO WITH MY NOTES?

OR

NFPA 921 15.3.4
The retention of original notes, diagrams, photographs and measurements........is the best practice.

Unless otherwise required by a written policy or regulation, such data should be retained.
4.4 EVIDENCE COLLECTION/ PRESERVATION

5 SECTIONS DEALING WITH EVIDENCE COLLECTION / PRESERVATION:

4.4.1 UTILIZING PROPER PROCEDURES
4.4.2 LOCATE, COLLECT AND PACKAGE
4.4.3 SELECT EVIDENCE FOR ANALYSIS
4.4.4 MAINTAIN CHAIN OF CUSTODY
4.4.5 DISPOSAL OF EVIDENCE

DUTIES SHALL INCLUDE:

Using proper physical and legal procedures to retain identify, document, collect and preserve evidence required with the investigation

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.
4.4.1 EVIDENCE COLLECTION/PRESERVATION

4.4.1 (A) REQUISITE KNOWLEDGE

Types of evidence associated with fire victims and fatalities and evidence preservation methods.

4.4.1 (B) REQUISITE SKILLS

Observation skills and ability to apply protocols to given situations.

4.4.2 EVIDENCE COLLECTION/PRESERVATION

Locate, collect & package evidence, given standard or special tools & equipment & evidence collection materials, so that evidence is identified, preserved, collected, & packaged to avoid contamination and investigator-inflicted damage and the chain of custody is established.
4.4.2* EVIDENCE COLLECTION/ PRESERVATION
Locate, document, collect, label & package and store evidence, given standard or special tools & equipment & evidence collection materials, so that evidence is 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.

4.4.3 EVIDENCE COLLECTION/ PRESERVATION
Select evidence for analysis given all information from the investigation, so that items for analysis support specific investigation needs

4.4.3 (A) REQUISITE KNOWLEDGE
Purposes for submitting items for analysis, types of analytical services available, and capabilities and limitations of the services performing the analysis
4.4.3 EVIDENCE COLLECTION/PRESERVATION

4.4.3 (B) REQUISITE SKILLS
Evaluate the fire incident to determine forensic, engineering, or laboratory needs.

4.4.4 EVIDENCE COLLECTION/PRESERVATION

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.

4.4.4 (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.
4.4.4 EVIDENCE COLLECTION/ PRESERVATION

4.4.4 (B) REQUISITE SKILLS

Ability to execute the chain of custody procedures and accurately complete necessary documents.

4.4.5 EVIDENCE COLLECTION/ PRESERVATION

Disposal 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.

4.4.5 (A) REQUISITE KNOWLEDGE

Disposal services available and common disposal procedures and problems.
**4.4.5 EVIDENCE COLLECTION/PRESERVATION**

**4.4.5 (B) REQUISITE SKILLS**

Documentation skills

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**4.5 INTERVIEWS**

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

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**4.5 INTERVIEWS**

4.5.1 Develop an interview plan
4.5.2 Conduct interviews
4.5.3 Evaluate interview

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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 POST-INCIDENT INVESTIGATION

4.6.1 Gather reports and records
4.6.2 Evaluate the investigative file
4.6.3 Coordinate expert resources
4.6.4 Establish evidence as to motive and/or opportunity, given an incendiary fire
4.6.5 Formulate an opinion concerning origin, cause, or responsibility for the fire

4.7 PRESENTATIONS

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

4.7.1 Prepare a written report
4.7.2 Express investigative findings
4.7.3 Testify during legal proceeding
4.7.4 Conduct public informational presentations

Reports

Neither NFPA 1033 nor 921 prescribes a specific report format. However, it does provide you some information about what a report should contain.
15.5 REPORTS

➢ The purpose of a report is to effectively communicate the observations, analysis, and conclusions made during an investigation.
➢ A specific format for a report is not prescribed.
➢ See 11.4.2.4 for court-mandated reports.

15.5.1 DESCRIPTIVE INFORMATION

Generally, reports should contain the following:
• Date, Time and location of incident
• Date and location of examination
• Date the report was prepared
• Name of the person or entity requesting the report
• The scope of the investigation (tasks completed)
• Nature of the report (preliminary, interim, final,..)

15.5.2 PERTINENT FACTS

• A description of the incident scene, items examined, and evidence collected should be provided.
• The report should contain observations and information relevant to the opinions.
• Photographs, diagrams, and laboratory reports may be referenced.
15.5.3 OPINIONS AND CONCLUSIONS

- The report should contain the opinions and conclusions rendered by the investigator.
- The report should also contain the foundation(s) on which the opinion and conclusions are based.
- The name, address and affiliation of each person who has rendered an opinion contained in the report should be provided.

11.4.2.4 Reports

The Federal Rules of Civil Procedures and some state courts may require an expert to prepare a report prior to deposition or trial. This is commonly referred to as a Rule 26 Report.

11.4.2.4 REPORTS

1. List of material reviewed and investigative activities conducted.
2. List of opinions.
3. Bases for those opinions.
4. List of your publications, last 10 years.
5. List of testimony, last 4 years.
17.6.1.3 Means of Hypothesis Testing
(Origin Chapter)

Ultimately, the investigator should be able to explain how the growth and development of a fire, starting at the hypothesized origin, is consistent with the data.

**Explain in a report!**

18.7.1 Establishing the fire cause
(Cause chapter)

In establishing a fire cause, the investigator should describe it in terms of competent ignition source providing enough heat to ignite the first fuel, and the circumstances of how they came together.

**Describe in a report!**

4.7 PRESENTATIONS

4.7.2 Express investigative findings.

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.

**Describe in a report!**
4.7 PRESENTATIONS

4.7.3 Testify during legal proceeding.

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 investigators demeanor and attire are appropriate to the proceedings.

3 Annex's

A. Explanatory Material.
Not part of the requirements.
For information purposes only.

B. Explanation of the Standard and Concepts of JPRS
Not part of the requirements.

C. Informational References

EVERYDAY IS EXAM DAY
“Gentlemen, we are going to relentlessly chase after perfection, knowing full well we will never catch it, because nothing is perfect. However, we are going to relentlessly chase after it because in the process we can obtain excellence.” Then he closed with these words, “Gentlemen, I am not remotely interested in just being good!”  

Vince Lombardi

Certifications Depend on 921 and 1033!

2014 Edition
Guide for Fire & Explosion Investigations

NFPA 921
2014 EDITION

Color Images throughout
Definitions:
- 7 New and 6 Modified
- Chapter Fire Protection Systems (8)
- Chapter Classification of Fire Cause (20)
- Chapter Analyzing the Incident for Cause and Responsibility (21)
Section on Thermometry (5.5.5)
Section on Fire Dynamics & Modeling (23.4.9)
Additional information on Arcing
402 Pages – 30 Chapters
192 Definitions

NEW IAAI
CFITRAINER.NET MODULE

921 and 1033 2014 Editions:
Important Revisions

THE GOOD OLE DAYS?

CHARLES WATSON
(AUG. 29, 1929 – APRIL 29, 2010)

“The hell with them good ole days! I’ll take these good ole days right now!”
BECAUSE

YOU WILL NEVER BE MORE AS AN INVESTIGATOR THAN YOU PUT INTO TRAINING!

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