

NOTEWORTHY DEVELOPMENTS RESPECTING NFPA 921

1. Introduction

Two notable developments have occurred in the codes and standards field since late 2016. First, the Organization of Scientific Area Committees (OSAC) has added NFPA 921 *Guide for Fire and Explosion Investigations* to the OSAC Registry of approved standards and guidelines. Second, the National Fire Protection Association (NFPA) has issued the 2017 edition of *NFPA 921*. This column starts with the second development, introducing *NFPA 921*, 2017 edition. Next, we briefly review OSAC, its Registry, and the implications of the approval of *NFPA 921*, and its companion document, *NFPA 1033 Standard for Professional Qualifications for Fire Investigator*, for the OSAC Registry.

2. Accessing *NFPA 921*, 2017 Edition Online

If you do not already own a copy, we will begin by explaining how to access *NFPA 921*, 2017 edition online, so that you may have a quick look at it before reading further. The 2017 (and earlier) editions of *NFPA 921* are available for free viewing or for purchase from the NFPA's website, www.nfpa.org. Here are instructions on how to access the free view of each edition of *NFPA 921*:

- ◆ Go to NFPA's Home page at www.nfpa.org.
- ◆ Click the "Sign in" link on the upper right. Sign in to your existing NFPA account, or click the link shown to create a free NFPA profile if you do not already have one.
- ◆ Once you have signed in, click the "Codes & Standards" tab (upper left part of the page).
- ◆ Click the "[List of NFPA codes & standards](#)" link. Next, enter "921" in the search by "By document number/title" field (on the right), and click "search."
- ◆ Click the "*NFPA 921*" link. This brings you to the "NFPA 921 Document Information Page."
- ◆ On the "[Current and Prior Editions](#)" tab, in the field next to "Edition to Display," click the down arrow and select "2017." (If you want to review earlier editions, in this drop down field, select the edition you want to see.)
- ◆ Find and click the link that says, "[Free access to the 2017 edition online.](#)"
- ◆ Click "I agree" (to consent to the terms of use and access the online document). A viewer application (TerraView™) will open giving you access to the entire document online.

You may navigate through the entire document, reading the whole document or any part. Unfortunately, the program will not permit you to print any portion of *NFPA 921* from the viewer. To purchase a PDF or print copy of any edition of *NFPA 921*, go to the "Codes and Standards" page (<http://www.nfpa.org/codes-and-standards>) and scroll to the links under "Purchasing Codes and Standards."

3. Finding Changes in the 2017 Edition

When you open the 2017 edition, have a look at the "Notice," immediately before Chapter 1 (on page 8). It explains the new "usability features" which help readers to track changes. In prior editions, changes were indicated using a vertical rule (*i.e.* line) in the margin beside the paragraph, table, or figure in which the change (other than editorial changes) occurred. Deletions were

indicated by bullets (•) between the paragraphs that remained.

Beginning with the 2017 edition of *NFPA 921*, the NFPA has revised how they signal changes in the new edition. Technical changes are now indicated by gray shading of the sections that have been revised. Be aware that even if only a word or sentence in a section has changed the whole section will be shaded in gray. Vertical rule (lines) are no longer used. Deletions are still indicated by bullets (•). New sections, tables, and figures are indicated by a bold, italic *N* in a gray box to the left of the new material. If sections have moved but are not otherwise revised, there is no signal to indicate how sections have been repositioned.

These usability features readily point the user to technical changes in the 2017 edition. However, you will have to make further inquiries to determine the nature and extent of these revisions. Gray shading might indicate any change, ranging from a small change of a few words, to something very substantial such as a completely rewritten paragraph. Therefore, we recommend a close study of the new edition.

One way to explore the changes from the 2014 edition to the 2017 edition is by making a side-by-side comparison of the relevant portions of these two editions. Another, more in depth way to analyze the revisions is by reviewing the reasons behind each one.

The NFPA Standards Development Process is very transparent. For those unfamiliar with the NFPA Standards Development Process, it will be helpful to first review "How the Process Works" available on the NFPA Codes and Standards web pages.¹ Below is an extremely abbreviated overview of this process.

The TC makes revisions that result in a First Draft, and later a Second Draft of the new edition. The TC makes revisions on its own initiative or because of changes proposed through public input (in the first draft stage) and public comments (in the second draft stage). The NFPA publishes online a First Draft Report and later a Second Draft Report. These reports show all of the proposed revisions in legislative text, substantiation for each revision, and the TC's responses to all of the public inputs and public comments. Even after the *NFPA 921*, 2017 edition is finalized and published, each of these reports are available for anyone to review at www.nfpa.org. In other words, all of the information leading to each revision in the 2017 edition (including the First Draft Report and the Second Draft Report) continue to be available on the "NFPA 921 Document Information Page" under the "Current and Prior Editions Tab." Just click the link, "[Read the archived revision information.](#)"²

As no one filed a formal opposition to the Second Draft, the NFPA issued *NFPA 921*, 2017 edition as a consent document. The revisions shown in the Second Draft Report are those

published in the 2017 edition. It will take some time to review the details available for all of the changes to the 2017 edition, so we recommend that you start with reviewing the archived revision information for those portions of *NFPA 921* most relevant to you.

4. Highlights of Changes

Most chapters of the *NFPA 921*, 2017 edition have been revised. From a global perspective, users of *NFPA 921* will probably find fewer controversial changes than in prior editions. However, while not controversial, the revisions are consequential. In this section, we highlight some of the changes. By way of suggestion, remember to review each revision in context. Some topics are covered in more than one chapter of *NFPA 921*; therefore, a change in one place may affect the interpretation of other sections dealing with the same topic in the same or different chapters. Further, *NFPA 1033* cross-references many of its provisions to the "current edition of *NFPA 921*."³ The 2017 edition is now the "current edition" of *NFPA 921*, so review relevant portions of *NFPA 1033* together with changes to *NFPA 921* to weigh the overall effect of these revisions.

In this section, we first summarize the changes in the first four chapters of *NFPA 921*, 2017 edition. The first four chapters contain the general principles and concepts that form the foundation of *NFPA 921*, so even a change of a word or phrase can be meaningful, particularly in a litigation context. Next, we identify a few of the other chapters that have undergone significant revisions.

- **Chapter 1 Administration** now explains the relationship of *NFPA 921* to the United States National Fire Incident Reporting System (NFIRS), which gathers information from fire departments through NFIRS reports. Concerns arose about the litigation implications of NFIRS reports that were not sufficient when measured by *NFPA 921* recommendations. The *NFPA 921* TC endeavored to put these concerns to rest with a revision to the "Scope" of *NFPA 921*, which now says:

1.1.2 This guide considers NFIRS reports as incident reports and not as investigation reports. The information contained in an NFIRS report should generally be considered as the preliminary report of the fire department concerning any fire or explosion incident. An NFIRS report should not be used as a fire investigation report.

- **Chapter 2 Referenced Publications** lists dozens of publications that are referenced in the body of *NFPA 921*. In prior editions, this chapter opened with a sentence that said, "The documents or portions thereof listed in this chapter are referenced within this guide and shall be considered part of the requirements of this document. [Emphasis added.] From a litigation perspective, these words were powerful because a lawyer or expert could argue that these words incorporated the documents listed in Chapter 2 into *NFPA 921*. In the right circumstances, when confronting an investigator who relied on *NFPA 921*, this sentence could open the door for an opposing attorney to cross-examine the investigator on not only the relevant material in *NFPA 921*, but also the relevant publications from this chapter. This could prove onerous. The 2017 edition has revised the opening sentence of Chapter 2 to say merely that the documents listed in this chapter "are referenced in this guide." This change comports with the *NFPA Manual of Style*.
- In **Chapter 3 Definitions**, new definitions have been added and others revised. Even though the changes are relatively few, definitions are central to important concepts

addressed elsewhere in *NFPA 921* and sometimes in *NFPA 1033*. Be aware that in *NFPA 921* definitions do not stand alone. To appreciate the changes, find each instance of the defined term in the body of *NFPA 921* and read it in context wherever the term or a related term appears. Further, since *NFPA 921* and *NFPA 1033* are interconnected, search for the same term(s) in sections of *NFPA 1033* that are cross-referenced to *NFPA 921*.

For example, the 2017 edition of *NFPA 921* adds a definition for "thermodynamics." The definition of this term clarifies its use in Chapter 5 (Basic Fire Science), Chapter 19 (Fire Cause Determination), and Chapter 22 (Failure Analysis and Analytical Tools).

"Thermodynamics" is also in *NFPA 1033's* s. 1.3.7 "List of 16." This section provides that, "The investigator shall have and maintain at a minimum an up-to-date basic knowledge" of thermodynamics (and 15 other topics) "beyond the high school level." Annex A in *NFPA 1033* cross-references this section to *NFPA 921*, saying that, "basic up-to-date information" on the topics in the List of 16 "can be found in the current edition of *NFPA 921*." Thus, this one new definition is directly relevant to not only three chapters in *NFPA 921*, but also to the mandatory knowledge base required of a fire investigator in *NFPA 1033*.

It is therefore incumbent on all users to comb through revisions to definitions, match them to the relevant passages in the body of *NFPA 921* and *NFPA 1033*, and assess their impact.

- In **Chapter 4 Basic Methodology**, Figure 4.3 has been modified to switch "develop & test hypothesis" to "... hypotheses," more accurately reflecting the process undertaken through the scientific method. More significantly, in 4.6.3, a greater emphasis has been placed on the necessity to try to refute or falsify a hypothesis in order to avoid confirmation bias, which can occur when a person is looking only for data that supports the hypothesis. Further, 4.3.7 "Select Final Hypothesis" has been added and 4.3.9 "Confirmation Bias" has been revised. Chapter 4 is the heart of *NFPA 921* and investigators should carefully study any changes as they could potentially affect any type of analysis. This Basic Methodology chapter is also the one most referenced in court, so it merits close attention, indeed.

As you can see from the few changes considered above, the revision of a mere word or phrase may have wide-ranging ramifications.

In addition to revisions in Chapters 1 to 4, below are some further highlights of changes to other chapters in the 2017 edition:

- ♦ Some revisions clarify important fundamental concepts, such as those in Chapter 5, "Basic Fire Science" (such as the introductory sections on fire science), Chapter 6, "Fire Patterns," Chapter 9 "Electricity and Fire," Chapter 18 "Origin Determination," and Chapter 19 "Fire Cause Determination" (such as changes to section 19.6.5 on the appropriate and inappropriate use of the process of elimination).
- ♦ Two chapters have been substantially rewritten: Chapter 8, previously "Fire Protection Systems," now called "Active Fire Protection Systems," and Chapter 16 "Documentation of the Investigation."
- ♦ Noteworthy changes have also been made to Chapter 23 "Explosions" (see the section on dust explosions) and Chapter 27 "Motor Vehicle Fires."

As mentioned earlier, most chapters of *NFPA 921* been revised. Those mentioned above are only a small sampling of the changes to the 2017 edition. Therefore, investigators and others using *NFPA 921* will need to set aside sufficient time to study these

continued on page 34

and other revisions in the 2017 edition. Evaluating the revisions will be largely subjective, and the importance of each will vary with the perspective of its users.

5. The OSAC Registry

In 2014, NIST in collaboration with the US Department of Justice launched the Organization of Scientific Area Committees (OSAC). Below is the statement of OSAC's purpose, centering on strengthening forensic science disciplines through standards and guidelines, which include *NFPA 921* and *NFPA 1033*:

The purpose of the OSAC is to strengthen the nation's use of forensic science by providing technical leadership necessary to *facilitate the development and promulgation of consensus-based documentary standards and guidelines* for forensic science, promoting standards and guidelines that are fit-for-purpose and *based on sound scientific principles*, promoting the use of OSAC standards and guidelines by accreditation and certification bodies, and establishing and maintaining working relationships with other similar organizations.⁴

OSAC's purpose, in part, is to develop standards and protocols for forensic practices that reflect best practices and serve as tools for accreditation of organizations and certification of professionals. In this context, OSAC considers fire investigations to be a forensic practice. OSAC has decided to build a registry of standards and guidelines it approves. As explained by NIST, "a standard or guideline that is posted on the Registry demonstrates that the methods it contains have been assessed to be valid by forensic practitioners, academic researchers, measurement scientists, and statisticians through a consensus development process that allows participation and comment from all relevant stakeholders."⁵

OSAC approved *NFPA 921*, 2014 edition and added it to the OSAC Registry on September 20, 2016. Three months later, OSAC approved *NFPA 1033*, 2014 edition for the Registry on December 22, 2016.⁶

For many years, IAAI's Fire Investigation Standards Committee (FISC) has published information about how each edition of *NFPA 921* and *NFPA 1033* undergoes a vigorous standards development process administered by the NFPA. This process is necessary before the NFPA issues each new edition of these documents. NFPA's process has added credibility to these documents for their use in practice, as well as in litigation. The OSAC approval process delivers another level of scrutiny over and above the NFPA standards development process, which provides additional assurance respecting the scientific underpinnings for both of these documents. OSAC's addition of these documents to its Registry should therefore elevate them in the eyes of the fire investigation community and the courts.

Note that at the time of writing this column, OSAC has approved the 2014 edition of *NFPA 921* (not the 2017 edition) for its Registry. The NFPA issued the 2017 edition of *NFPA 921* in November 2016, after OSAC's review of the 2014 edition was completed. *NFPA 921*, 2017 edition only became available for distribution in early 2017. Like *NFPA 921* 2014 edition, the 2017 edition will also have to go through the OSAC Registry approval process. Members of the fire investigation community can either monitor the *OSAC News* page or subscribe to OSAC forensic science updates⁷ to stay informed of developments concerning the 2017 edition.

6. Conclusion

We hope this overview of developments respecting *NFPA 921* has been useful. As you read this column in April 2017, another fiscal year of the IAAI finishes at the IAAI Annual International Training Conference in Las Vegas. So too does the work of FISC for another year. We would like to acknowledge, with thanks, each of our FISC members for their contributions to the work of our committee for the benefit of the IAAI!

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- 1 See "How the Process Works" available on the NFPA Codes and Standards web pages at <http://www.nfpa.org/codes-and-standards/standards-development-process/how-the-process-works>.
- 2 Here are instructions for accessing the documents that detail the revision process: Go to NFPA's Home page at www.NFPA.org. Click the "Sign in" link on the upper right. Sign in to your existing NFPA account, or click the link shown to create a free NFPA profile if you do not already have one. Once you have signed in, click the "Codes & Standards" tab (upper left part of the page). Click the "List of NFPA codes & standards" link. Next, enter "921" in the search by "By document number/title" field (on the right), and click "search." Click the "*NFPA 921*" link. This brings you to the *NFPA 921* Document Information Page. Under the "Current and Prior Editions Tab," select the 2017 edition from the drop down field and then click the link, "Read the archived revision information." For those unfamiliar with the NFPA Standards Development Process, it will be helpful to first review "How the Process Works" available on the NFPA Codes and Standards web pages at <http://www.nfpa.org/codes-and-standards/standards-development-process/how-the-process-works>.
- 3 To find these cross-references, search Annex A in *NFPA 1033 Standard for Professional Qualifications for Fire Investigator*, for all references to *NFPA 921*, and then refer to the indicated section or paragraph in *NFPA 1033*.
- 4 NAT'L INSTITUTE OF STANDARDS AND TECHNOLOGY, FORENSIC SCIENCE, *About OSAC* <https://www.nist.gov/topics/forensic-science/about-osac> (last visited Feb. 20, 2017) (emphasis added).
- 5 NAT'L INSTITUTE OF STANDARDS AND TECHNOLOGY, FORENSIC SCIENCE, *OSAC Registry* <https://www.nist.gov/topics/forensic-science/osac-registries> (last visited Feb. 20, 2017).
- 6 NAT'L INSTITUTE OF STANDARDS AND TECHNOLOGY, FORENSIC SCIENCE, *OSAC Approved Registry Documents* <https://www.nist.gov/topics/forensic-science/osac-approved-registry-documents> (last visited Feb. 20, 2017).
- 7 Sign up for email updates at <https://www.nist.gov/sign-e-mail-updates> (last visited Feb. 20, 2017).