Guidelines for Conducting A Technical Review for Fire Investigation

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ABSTRACT
During the course of almost every investigation, it is likely that an investigator’s reports, notes, and transcripts of testimony, otherwise referred to as the investigators “work product” will be reviewed by someone. The purpose of a review, as well as the person conducting the review, can be quite different depending on the circumstances and reasons for the review.

A review may be for purposes of “proof reading” to ensure spelling and grammar is correct, or to ensure the report meets organizational format and style. In other cases, a review can also be undertaken to analyze and evaluate the investigator’s reasons, reasoning, and opinions to ensure reliability of the conclusions. Other reasons for a review may be to evaluate an investigators job performance.

The person conducting the review may vary depending on the reason for the review. A review may be conducted by a secretary; by a supervisor, co-worker or colleague; or, by someone from another “interested party;” or, by a trainer, teacher or evaluator; or even by the author of the report. The types of reviews mentioned here are obviously different types of reviews with different purposes and goals. The different types of reviews also have different responsibilities for the reviewer.

Different types of reviews are cited in NFPA 921-17, Guide for Fire and Explosion Investigations, §4.6 titled, “Review Procedure.” The types of reviews noted are the Administrative Review (§4.6.1), the Peer the Technical Review (§4.6.2), and the Peer Review (§4.6.3).

While §4.6 states that reviews “by other persons may be helpful,” there is no guidance is provided regarding a process, procedure, or methodology for conducting a review. The subject and purpose of this article and presentation will be to provide guidelines and an effective methodology for conducting the Technical Review, and documenting the Technical Review. Further, it will describe the benefit of conducting a Technical Review and how it can serve as an additional test of the investigator’s conclusions and opinions.

INTRODUCTION
The types of reviews that can be conducted of an investigator’s work product are described in NFPA 921 Guide for Fire and Explosion Investigations, 2014 ed., §4.6 “Review Procedure.” The general provisions for conducting reviews states:

A review of a fire investigator’s work product (e.g., reports, documentation, notes, diagrams, photos, etc.) by other persons may be helpful, but there are certain limitations. This section describes the types of reviews and their appropriate uses and limitations.

This section establishes that it is the investigator’s work product is subject to review, that the reviews may be “helpful,” it is in the individual type of reviews in the following subsections that describe the benefit.
TYPES OF REVIEWS

It is in the subsections of NFPA 921-17, §4.6, that describes the different type of reviews that can be conducted. Essentially the types of reviews are classified based on their purpose. The type of reviews identified are the Administrative Review, the Peer Review and the Technical Review.

The review for purpose spell checking, for style and format issues, or file completeness would be considered an “Administrative Review,” according to §4.6.1 or NFPA 921-17. An Administrative Review is described in §4.6.1 as:

An administrative review is one typically carried out within an organization to ensure that the investigator’s work product meets the organization’s quality assurance requirements. An administrative reviewer will determine whether all of the steps outlined in an organization's procedure manual, or required by agency policy, have been followed and whether all of the appropriate documentation is present in the file, and may check for typographical or grammatical errors.

Meanwhile, the “Peer Review,” according to NFPA 921-17, §4.6.3, should be reserved for circumstances where the reviewer(s) are not known to or selected by the author of the report, and where the reviewers “should not have any interest in the outcome of the review,” and states as follows:

Peer review is a formal procedure generally employed in prepublication review of scientific or technical documents and screening of grant applications by research sponsoring agencies. Peer review carries with it connotations of both independence and objectivity. Peer reviewers should not have any interest in the outcome of the review. The author does not select the reviewers, and reviews are often conducted anonymously. As such, the term “peer review” should not be applied to reviews of an investigator’s work by coworkers, supervisors, or investigators from agencies conducting investigations of the same incident. Such reviews are more appropriately characterized as “technical reviews,” as described above.

As defined and described by NFPA 921-17, the “Peer Review” is essentially only appropriate as a “pre-publication review of scientific or technical documents,” and where the “reviewers should not have any interest in the outcome.” Because of these and other limitations cited, the “Peer Review” serves no practical purpose as a means of review in “real-world” fire investigation settings.

Therefore, the type of review appropriate for “real-world” applications, and the subject of this article and presentation, is the “Technical Review.” The Technical Review is described in §4.6.2 of NFPA 921-17,

“A technical review can have multiple facets. If a technical reviewer has been asked to critique all aspects of the investigator’s work product, then the technical reviewer should be qualified and familiar with all aspects of proper fire investigation and should, at a minimum, have access to all of the documentation available to the investigator whose work is being reviewed. If a technical reviewer has been asked to critique only specific aspects of the investigator’s work product, then the technical reviewer should be qualified and familiar with those specific aspects and, at a minimum, have access to all documentation relevant to those aspects. A technical review can serve as an additional test of the various aspects of the investigator's work product.”

Therefore, according to §4.6.2, the Technical Review is the appropriate type of review to “critique” the various “facets” of an investigator's work product. Additionally, the Technical Review can also provide “an additional test of the various aspects of the investigator's work product.”
LIMITATIONS OF TECHNICAL REVIEWS

In addition to providing the categories and the subject matter for the different types of reviews, NFPA 921-17 also provides what is titled “Limitations” for each of the three reviews. The “limitations” provided in §4.6.2.1, “Limitations of Technical Reviews,” are more like “warnings” for the reviewer than actual “limitations,” that provide:

“When a technical review may add significant value to an investigation, technical reviewers may be perceived as having an interest in the outcome of the review. Confirmation bias (attempting to confirm a hypothesis rather than attempting to disprove it) is a subset of expectation bias (see 4.3.9). This kind of bias can be introduced in the context of working relationships or friendships. Investigators who are asked to review a colleague's findings should strive to maintain a level of professional detachment.”

What the warnings for the reviewer actually provide guidance that the primary responsibility for the reviewer is to remain “objective.” The best method for a reviewer to remain object in conducting the Technical Review is to base the review on authoritative standards and references, (e.g. NFPA 921, NFPA 1033, “Kirk’s Fire Investigation,” Drysdale’s “Introduction to Fire Dynamics”), rather than personal experience or personal preference. “Critical thinking is about determining what we are justified in believing, and that involves and openness to other points of view, a tolerance for opposing perspectives, a focus on the issue at hand, and fair assessments of arguments and evidence.”

In conducting a Technical Review, the reviewer may actually find methods that enhance the methodology and reliability of their own investigations.

ROLE OF THE TECHNICAL REVIEWERS

As NFPA 921-17, §4.6 states, “A review of a fire investigator’s work product... by other persons may be helpful” imply the review of persons other than the primary investigator himself. However, a Technical Review can be helpful if conducted by the investigator himself.

A Technical Review may be initiated by a number of different reviewers depending on the reason for the review. A Technical Review may be conducted by a supervisor, a co-worker, a colleague, a client, someone from another interested party (e.g. investigator, attorney), an educator (e.g. college instructor, fire academy instructor), evaluator (e.g. promotion, certification), or by the author of the report himself. Regardless of who conducts the Technical Review, methodology and procedure for conducting the Technical Review recommended in these guidelines are exactly the same.

The text of NFPA 921 states that the Technical Review can also provide “an additional test of the various aspects of the investigator's work product.” That “test” is often assumed to be from someone other than the author, but the Technical Review, if conducted by the author of the report, can also serve as a test for the author himself.

THE TECHNICAL REVIEW AS A “CRITIQUE.”

According to NFPA 921-17, §4.6.2, the “Technical Review” is the appropriate type of review to “critique” an investigator's technical work product. Various definitions of “critique: include:

- “1. A critical review or commentary, especially dealing with a literary or artistic work;
- 2. A critical discussion of some specific topic.”
- “A method of disciplined, systematic study of a written or oral discourse.”
- “A method used to “evaluate (a theory or practice) in a detailed and analytical way.”
- “A critique is the objective analysis of a literary or scientific piece, with emphasis on whether or not the author supported the main points with reasonable and applicable arguments based on facts.”
Therefore, based on NFPA 921-17 and the various definitions of “critique,” the method to be utilized by a Technical Reviewer should be an objective, systematic process which employs the elements of critical thinking, and critical reasoning.

**Critical Thinking and Critical Reasoning**

In “The Power of Critical Thinking,”7 Vaughn provides that “Critical thinking focuses not on what causes the belief, but on whether it is worth believing. A belief is worth believing, or accepting, if we have good reasons to accept it.” “Critical thinking offers us a set of standards embodied in techniques, attitudes, and principles that we can use to assess beliefs and determine if they are supported by good reasons.”

“Critical thinking is a reasonable, reflective thinking that is focused on deciding what to believe or do.”8 Furthermore, critical thinking is about determining what we are justified in believing … and a fair assessment of arguments and evidence.9

The application of critical thinking skills to the Technical Review would suggest the same philosophy; that the reviewer not believe anything until and unless there is sufficient evidence. Thus, the technical reviewer assumes the role of a “Critical Reviewer” and in so doing will be analyzing an investigator’s work product, such as a written report, in an effort to determine whether there is sufficient reason to believe the conclusions being presented.

**A Critique is not Simply Finding Fault**

At the outset it is important to recognize and understand that the Technical Review “critique” is not, and should not, be predicated on the concept of finding “negative criticisms” of an investigator’s opinions as expressed in their reports or testimony. “Although critique is commonly understood as fault finding and negative judgment, it can also involve merit recognition, and in the philosophical tradition it also means a methodical practice of doubt.”10

The Technical Reviewer should serve a similar role as does a theatre critic, “someone whose comments and judgements may either be positive or negative.”11 The Technical Review can reveal both “good” and “bad” qualities of what is being reviewed. For example, if the Technical Review is being conducted to determine whether the opinions and conclusions in the reports and testimony are reliable, and adequately supported by evidence, the review may find all or some of the conclusions are acceptable and supported by authoritative references and the appropriate standards of care.

**ASPECTS OF THE TECHNICAL REVIEW**

NFPA 921-17, §4.6.2 “Technical Review” states, “A technical review can have multiple facets” and that, “a technical review can serve as an additional test of the various aspects of the investigator's work product.”

There are two facets, or aspects, of an investigator’s report that are most likely to be subjected, to a Technical Review. The first aspect most likely to be subject to Technical Review would be an investigator’s written report.

The second aspect likely subject to the Technical Review would be in regards to an investigators’ performance. The review of an investigator’s performance may be actual fire or explosion scenes, or for training, certification, promotion, or actual fire scene examinations and investigations. The “critique” of an investigator’s performance would be to determine whether the fire investigator had followed appropriate methodologies, processes and procedures, in accordance with recognized professional Standards and standards of care.
The Written Report
“The purpose of a written report is to document an accurate and concise reflection of the investigator’s findings.” Ultimately, an primary purpose of an investigator’s written report, like a report or article on any subject, is intended to convince or persuade someone of something. The role of the Technical Reviewer, as a critical reviewer, is to find whether the “something” in the report is worth believing.

Requirements for An Investigator’s Written Report
NFPA 921-17, provides guidance for the preparation of an investigator’s written report, in §16.5, where it states in part,

“The report should contain facts and data that the investigator can rely on to render any opinions and should contain the investigator’s reasoning of how each opinion was reached.”

This language mirrors the requirements found in NFPA 1033-14 Ed., Standard for Professional Qualifications for Fire Investigator. If the investigator prepares a written report, the requirements for a fire investigator’s written report are found in NFPA 1033, 1-4, §4.7.1, which states:

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).

This section of NFPA 1033 is very clear, that the responsibility of the author of a written report is to one, express the opinions, two, provide the facts and data relied upon, and three, contain the reasoning for each opinion. The method of “reasoning” in this section, refers to another requirement for fire investigators found in another section of NFPA 1033-14 Ed., in §4.1.2 “Systematic Approach,” which provides:

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.

Another requirement intrinsically related to the requirements for the ‘opinions” regarding written report of §4.7.1 are the requirements regarding an investigator’s “opinions,” found in §4.6.5 and states:

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. (Emphasis added)

While these three sections of NFPA 1033-14 ed. provide the core elements for an investigator’s written report, they will also form the objective basis for the Technical Review.

Additional guidance regarding the elements a written report can be found in NFPA 921-17 Ed., §16.5 “Reports.” These elements constitute additional reference for the report author, and subsequently provide additional reference and measurable criteria for the reviewer to determine performance.

Reviewing An Investigator’s Performance
The minimum job performance requirements (JPR’s) for a fire investigator are provided in NFPA 1033 Standard for Professional Qualifications for Fire Investigator. The stated intent for the development of NFPA 1033 Standard was to provide requirements that could be used to “determine that an individual, when measured to the standard, possesses the skills and knowledge to perform as a fire investigator.” It is for this reason that the JPR’s listed in NFPA 1033 are the ideal criteria for analyzing and evaluating a
fire investigator’s work product for performance. It is also worth noting, NFPA 1033 is the applicable Standard whether an investigator references any authoritative sources or not.

MEASURABLE CRITERIA FOR TECHNICAL REVIEW:
One of the concerns identified in the discussion on “Limitations of Technical Review” found in NFPA 921-17, §4.6.2.1, was that the reviewer should attempt to remain “detached,” or objective. The best method to do that is for the Technical Reviewer to base their comments on fire investigation Standards on accepted fire investigation standards of care.

NFPA 1033 establishes the requirements for a fire investigator’s methodology, the formation of opinions, the content of an investigator’s written report, and aspects of an investigators performance. NFPA 921 and other authoritative references provide additional resources for evaluating the investigator’s work product. NFPA 1033 is the applicable Standard for evaluating a fire investigator’s work product, whether the investigator referenced any authoritative sources or not. In addition, if an investigator cites other sources of information as references to support their opinions, those sources referenced also become other measurable criteria by which the investigator opinions can be evaluated. For example, if an investigator cites in their report, or testifies that they had followed, or their investigation is consistent with NFPA 921, their opinions can then be evaluated in accordance with NFPA 921.

NFPA 1033 also references several ASTM (American Society for Testing and Materials) Standards that provide requirements, consistent with those in NFPA 1033, for anyone rendering opinions on fires or explosions. Like the JPR’s in NFPA 1033, the ASTM Standards provide additional criteria upon which to evaluate an investigator’s performance. The ASTM Standards referenced include: ASTM E678, Standard Practice for Evaluation of Technical Data, ASTM E620, Standard Practice for Reporting Opinions of Technical Experts, and ASTM E1020-96, Standard Practice for Reporting Incidents That May Involve Criminal or Civil Litigation.15

As a result, these documents provide the basis to effectively evaluating an investigator’s opinions, or conclusions, and the reasons relied upon to support the conclusions, as well as the methodology, and reasoning utilized to reach the conclusions in the investigator’s written reports or testimony.

THE METHODOLOGY FOR CONDUCTING THE TECHNICAL REVIEW

“You cannot determine the worth of a conclusion until you identify the reasons.”16

Analysis and Evaluation
The recommended method for conducting a critical review utilizes a two-step process consisting of analysis and then evaluation, what Fisher refers to as “Thinking Map.”17 “You cannot reasonably to an argument unless you first understand it, so the “analysis” questions guide you in understanding what’s being said and argued. The “evaluation” questions the guide you in deciding whether you should be persuaded by the argument or not.”18

Analysis
In the first step, the report is analyzed to identify the conclusion(s), and then the reasons. The conclusions can be either stated or implied. The key is to look for indicator words, such as “therefore,” “in conclusion,” or “based on the evidence.” Whatever follows these and similar “key words” are conclusions.

The “reasons” are whatever facts, data, evidence are provided in the report to support the conclusions. The reasons are usually stated, although in some cases there may be implied reasons as well, and they should be recognized and included in the analysis.
### Example of Analysis for an Origin Determination

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<thead>
<tr>
<th>Analysis of the Origin Determination</th>
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<tbody>
<tr>
<td>Origin Determination:</td>
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<tr>
<td>• “Fire pattern analysis indicated two separate and distinct areas of origin.”</td>
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<tr>
<td>Reasons Supporting the Origin Determinations:</td>
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<tr>
<td>• Fire patterns and physical evidence indicated the fire originated in two separate areas.</td>
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<tr>
<td>• “Fire pattern analysis was consistent with the use of a large amount of an ignitable liquid to accelerate the fire.”</td>
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<tr>
<td>• “The fire spread and large amount of fire was not consistent with anything other than the use of an ignitable liquid.”</td>
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<tr>
<td>• “Fire movement patterns were not normal for the building and/or avenues of ventilation” and “movement patterns were distorted.”</td>
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### Evaluation

In the second step, the reasons are *evaluated* to determine whether they are “acceptable,” and whether they support the conclusion. Evaluation determines whether the reasons are *reliable*, or determining whether they are consistent with, or supported by scientific research, scientific testing, or recognized authoritative resources.

A good bit of advice regarding a written report is that “the experts report should read like a master’s thesis.” That means footnotes and references! Did the author provide citations or references as reasons to support the conclusion(s)? Most of the expert reports this author reviews do not include any citations to authoritative references. References to authoritative sources are essential in demonstrating support for the reasoning and the conclusions.

If references are not cited in the report, are there references that support, or refute the authors’ reasons? Once again, the obligation of the reviewer is to conduct an “objective evaluation” to determine whether the reasons are “acceptable,” and as such, reliable. Therefore, if the author of the report did not cite any references to support the conclusions, it is the obligation of the reviewer find and cite references that either support or refute the reasons provided, and thus substantiate the reviewers comments. How can the reviewer determine reliability of the reasons if the author did not provide citations to authoritative references? This process also is more likely to maintain and demonstrate the objectivity of the reviewer.

Once the “reasons” have been identified, the evaluation of the reasons needs to be conducted. In the evaluation process, the reviewer should provide a detailed discussion of each reason stated, with citations and references to authoritative sources which either support or refute the reasons.
Example of Evaluation for the Origin Determination

Evaluation of the Origin Determination

Discussion Regarding “Separate and Distinct” Origins

Before concluding there were “two or more separate simultaneous, nonrelated burning fires”, which is the definition of “multiple fires” according to NFPA 921, three criteria that must be met. The investigator must be able to prove and demonstrate the fires were:

1. Separate (see §24.2.1)
2. Non-connected (see §24.2.1.1), and
3. Non-related (see §24.2.1)

The physical evidence at the fire scene does not support a conclusion that there are separate fires at the residence.

Evaluating Investigator Performance versus Investigator Qualifications

It should be noted that every investigator is subject to performance evaluation on every investigation they conduct. As the old saying goes, “You’re only as good as your last investigation.” The number of seminars attended, certifications held, degrees obtained are simply not relevant to the evaluation of an investigator’s performance for a particular incident. This is similar to that which occurs in a “Daubert challenge.”

Evaluating Performance

There are two primary reasons for evaluating an investigator’s performance. The first would be, did the investigator’s performance effect the investigator’s opinions, and/or the conclusions. In the second instance, the work product may be evaluated simply for measuring performance (e.g. training, certification). In either instance, the Technical Review serves as a means to measure an investigator’s performance.

In evaluating performance the Technical Reviewer should look for and note specific performance activities in the work product, whether the report, notes, sketches, or photographs. In so doing, the questions to be answered are whether the investigator performed the activities required by his responsibility, and did the performance meet the accepted Standards (NFPA 1033 is an excellent resource for this purpose), or acceptable standards of care (e.g. NFPA 921, Kirk’s Fire Investigation, Drysdale’s Introduction to Fire Dynamics). In both instances the review and largely depend in the purpose of the review and mandate of the reviewer.

These are some of the performance issues typically subject to evaluation, and the corresponding references to performance measures:

1. Does the report contain facts and data that the investigator relies on in rendering an opinion, contains the reasoning of the investigator by which each opinion was reached?
   a. NFPA 1033-14, §4.7.1
2. Are the opinions and conclusions supported by the data, facts, records, reports, documents, and evidence.
   a. NFPA 1033-14, §4.6.5
3. Does the report reflect that the investigator developed or tested hypotheses?
a. NFPA 1033, §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. Does the work product (report, notes, sketches, photographs) demonstrate debris removal adequate to examine and document fire patterns?
   a. NFPA 1033-14, §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.

5. Does the work product (report, notes, sketches, photographs) demonstrate scene reconstruction necessary examine and document fire patterns?
   a. NFPA 1033-14, §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 pre-fire location, and the area(s) or point(s) of origin is discovered.

6. Does the work product demonstrate efforts were made to photograph, document, or preserve evidence that applied not only to evidence relevant to an investigator's opinion, but also to evidence of reasonable alternate hypotheses that were considered and ruled out?
   a. NFPA 921-17, §12.3.5.2 Documentation

7. Does the work product reflect that special care had been taken to photograph and document the scene and preserve relevant evidence?
   a. NFPA 921-17, §12.3.5.5 Documentation Prior to Alteration

8. Does the work product demonstrate the analysis of methods of fire spread, heat transfer and fire dynamics analysis had been conducted?
   a. NFPA 1033-14, § 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.
   i. (A) Requisite Knowledge. Fire behavior and spread based on fire chemistry, fire dynamics, and physics, fire suppression effects, building construction.
   b. NFPA 921-17, §18.1.2 (4) Fire Dynamics and §18.4.7 Fire Dynamics Fundamentals of fire dynamics can be used to analyze the data to aid in the development of origin hypotheses and to complement other origin determination techniques. Such analyses can help in the identification of potential fuels that may have been the first item to ignite, the sequence of subsequent fuel involvement, the recognition of other data that may need to be collected, the analysis of fire patterns, and the identification of potential competent ignition sources.

**Evaluating Photographic Images**
Evaluating photo images, particularly of the fire scene examination, can supplement the evaluation of an investigators’ report. Digital images can support the opinions and conclusions even if they are not directly mentioned in the report. For example, the digital images of a scene examination can provide documentary evidence of the debris removal (required in NFPA 1033-14, §4.2.6) and scene reconstruction (required in NFPA 1033-14, §4.2.7) even though they are not discussed in the report. On
the other hand, the photographic documentation may also provide demonstrable evidence that debris removal and reconstruction had not been conducted. The absence of debris removal and reconstruction may then be addressed are performance requirements not met, and potentially how the failure to reconstruct the fire origin resulted in the failure to discover or analyze additional fire patterns, or the misinterpretation of the fire patterns observed.

Evaluating Testimony
In some instances the investigator may not prepare a written report, but will provide testimony in either deposition or trial. In those instances, the analysis and evaluation of a Technical Review can still be of value.

The evaluation of an investigator’s testimony is dependent on the questions being asked. However, whether in deposition or trial, the questions asked of the investigator generally involve the opinions and conclusions, and reasons that support them. Testimony may actually fill in gaps in a report, such as providing the investigators’ reasoning, which the technical Reviewer should then consider in the evaluation.

In any event, the Technical Review process is conducted in the exact same manner for testimony as with other work product, such as a written report.

THE PROCESS OF CONDUCTING THE TECHNICAL REVIEW
Conducting the Technical Review should be an “active” process, meaning the review is “interactive.” The Technical Reviewer, in conducting a critical review, should be asking questions, or have a “conversation” with the author. Think of this process as listening to a presentation. You, as the reviewer, may ask questions to clarify issues or obtain more information from the presenter. The Technical Review should be approached in the same manner.

The following steps are recommended and can assist in conducting an effective Technical Review:

1. Read the entire report.
   - Highlight conclusions and reasons as you read.
   - Highlight any other main points.
2. Read the report a second time, this time making your own notes, and read actively.
   - Active Reading
     i. “Ask” questions of the author
        1. Write the questions
     ii. “have a conversation with the author”
     iii. Essentially, the evaluation should ask questions like:
        1. Does the author provide reasons to support the conclusions?
        2. Do the reasons (actually) support the conclusion?
        3. Are source cited to support the conclusion?
        4. Are there authoritative sources to support or refute the reasons?
        5. Are the reasons reliable?
        6. Did the author follow an appropriate methodology to reach the conclusion?
   - Prepare a summary as you read and make notes
     o Recommend using a note pad, rather than writing in the margins.
     ▪ Identify page numbers and paragraphs
• This will assist in reviewing your notes later
  o Develop you own symbols
    ▪ >, ?, •, :, ,
• Identify the CONCLUSIONS
• Identify the REASONS
  o Do any reasons need more information or support
  o Ask questions of the author – “have a conversation with the author”
    ▪ Questions may be answered later in the report
3. Outline at the end, separately, or in your report develop a summary of pertinent information:
  • Note Conclusions
    • Origin
    • Cause
    • Multiple fires
    • Presence of an accelerant
  • Note any Reasons to support the Conclusions
    ▪ Stated or implied reasons must be considered
    • Remember, the reasons are required to be stated by NFPA 1033
    ▪ Evaluate each reason
    • Are the Reasons Reliable?
    • Cite references that support or refute

DOCUMENTING THE TECHNICAL REVIEW:
In all instances where a Technical Review had been conducted, the Technical Reviewer should document and maintain the notes and records of the review. This record should contain all the elements described and recommended in these guidelines, such as: the conclusions; the reasons, both stated and implied, that were identified that support the conclusion; any references to authoritative documents or treatises the reviewer relied upon to either support, challenge, or refute the reasons provided in the report.

The Technical Review may form the basis of a report itself, separate from a typical report regarding the “origin and cause” of the fire. Whether a report is prepared depends on the purpose of the Technical Review, the role of the reviewer, and the agency, institution, or client requesting the Technical Review.

Responsibility of the Reviewer:
While not stated in NFPA 921, it appears reasonable that there are responsibilities for the reviewer who conducts the Technical Review, depending on their authority, position, and reason for the review.

If a report is to be subject to a Technical Review by a supervisor, co-worker or colleague of the author, as what NFPA 921 describes as an “additional test,” the Technical Review should conducted after a completed “draft” report is issued. The results of the Technical Review should then be shared with the author of the report. The author review the reviewer’s findings, particularly if the findings involve discrepancies, weakness in reasoning, or reasons that required additional support. The author may find it necessary to amend his initial “draft” to address the findings of the Technical Review. The Technical Reviewer may or may not have an opportunity to review the amended “draft” before the report is issued or submitted.

In all other cases the findings of the Technical Reviewer should report the results in accordance with the procedures, policy and directive of the agency, institution or client.
Signature of a Technical Reviewer
If the signature of a reviewer is to be included on a written report (e.g. “reviewed by”) the type of review conducted should be identified, such as “Administrative Review by”, or “Technical Review by.”

The responsibility of a “Technical Reviewer” should not be taken lightly. The signature as a “Technical Reviewer” implies that reviewer had conducted and documented their “critique,” or “critical analysis” of the report, prior to the report being issued. Secondly, the signature further implies that the conclusions and opinions in the report are sufficiently supported by facts, data and evidence, that and that the performance had met professional Standards, such as NFPA 1033, and appropriate standards of care.

This likely means that the issued report had been amended to reflect the issues raised in the critique, and that the Technical Reviewer had re-analyzed and re-evaluated the report.

Finally, the documentation in the Technical Review may become part of the investigation file. Appropriate legal advice should be sought for further information.

CONCLUSION
The Technical Review is intended to be the type of review by which to critique, and critically analyze an investigators’ work product and by which the opinions, conclusions and reasons can be evaluated to determine reliability; and performance can be evaluated do determine compliance to accepted standards to ensure reliability of the conclusions.

Objectivity is an important consideration, but by following the recommendations provided in these guidelines the work product is measured against fire investigation Standards, such as NFPA 1033 and other authoritative sources, such as NFPA 921 and others, rather than subjective measures and subjective reviewer opinions.

These guidelines allow for a number of different entities for different purposes to utilize the same methodology and framework in conducting a Technical Review.

The benefits in conducting the Technical Review are the assurance that the investigator opinions and conclusions are more likely to be supported by reliable evidence.

ABOUT THE AUTHOR
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END NOTES
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