Terry-Dawn Hewitt, Esq.
Chair
and
Wayne J. McKenna, Esq.

Implementing the *NRC/NAS Report*: Introducing The National Commission on Forensic Science and The Organization of Scientific Area Committees

1. Introduction

The Fire Investigation Standards Committee (FISC) endeavors to keep IAAI members apprised of happenings concerning industry standards affecting fire investigators. One of the most significant events increasing the importance of industry standards occurred in 2009 when the National Research Council of the National Academy of Sciences published its report, Strengthening Forensic Science in the United States: A Path Forward (the NRC/NAS Report).[1] The NRC/NAS Report has become a mighty force driving the forensic science community, including fire investigators, to improve the reliability of their analyses. Industry standards are crucial to this endeavor.

The *NRC/NAS Report* makes 13 recommendations. Table 1 summarizes only those recommendations most relevant to fire investigators (starting with recommendation number 2) and labels or nicknames for each one for the ease of discussion. The number in the left column corresponds to the recommendation number assigned by the *NRC/NAS Report*. Note that the *NRC/NAS Report* focused mainly on forensic disciplines practiced in forensic laboratories and the professionals working in these laboratories (rather than fire investigations). The report's application has expanded over time. Therefore, when reading the following recommendations, assume that the phrase "forensic science investigations" includes fire investigations as well as related laboratory work such as fire debris and explosives analysis. Further, read the terms "forensic professionals" and "forensic science practitioners" as including fire investigators.

Table 1: Summary of Recommendations from the *NRC/NAS Report*

No.	Nickname	Recommendation
2.	Standardized Terminology & Reporting	Standardize the terminology for reporting on and testifying about the results of forensic science investigations and the minimum requirements for information to be used in reports.
3.	Foundational Research	Conduct and publish (in respected scientific journals) research that verifies the accuracy, reliability, and validity of the basic premises underlying each forensic discipline; quantify limits of reliability when forensic evidence conditions vary, and develop measures of uncertainty in the conclusions of forensic analyses.
5.	Human Factors—Bias & Error	Research human observer bias and error in forensic examinations and develop standard operating procedures (SOPs) to minimize potential bias and error. These SOPs should apply to all forensic analysis that may be used in litigation.
6.	Best Practices & Standards	Work with NIST and partners to develop tools and standards to advance measurement, validation, reliability, information sharing, and proficiency testing in forensic science and to establish protocols for forensic examinations, methods, and practices. Standards should reflect best practices and serve as accreditation tools for organizations providing forensic services and as guides for the education, training, and certification of professionals.
7.	Mandatory Accreditation & Certification	Make mandatory the accreditation of organizations providing forensic science services and individual certification of forensic science practitioners.
8.	Quality Assurance & Quality Control	Forensic laboratories[3] should establish routine quality assurance and quality control procedures to ensure the accuracy of forensic analysis and the work of forensic practitioners.
9.	National Code of Ethics	Establish a national code of ethics for all forensic science disciplines that can be enforced through certification.
10.	Training & Education	Improve graduate education programs with attractive scholarship and fellowship offerings and establish continuing legal education programs for law students, practitioners, and judges.
11.	Medicolegal Death Investigations	Improve death investigations through establishing a nationwide medical examiner system with all medicolegal autopsies being performed or supervised by a board certified forensic pathologist.

Two U.S. federal government-sponsored organizations are currently involved in implementing recommendations of the NRC/NAS Report: the National Commission on Forensic Science (NCFS, also called the Commission) and the Organization of Scientific Area Committees (OSAC). For more information about the NRC/NAS Report, its effect in heightening the role of industry standards, and the initial government efforts in acting on the report's recommendations, see *A Perfect Storm Brewing for Fire Investigators in Court*[4] (available for free download). This column starts where the Perfect Storm paper ended, highlighting some of the initiatives of the NCFS and OSAC pertaining to fire investigators.

2. What are the NCFS and OSAC?

To implement the initiatives outlined in the *NRC/NAS Report,* the U.S. Department of Justice (DOJ) and the National Institute of Standards and Technology (NIST) collaborated to launch two organizations, each with a view to strengthening forensic science in the United States. The first was the NCFS, a federal advisory committee established in 2013 and tasked with making policy recommendations to the U.S. Attorney General to improve the reliability of forensic sciences, particularly in the justice system. While the work of the NCFS is policy oriented, the second organization formed in 2014 under the leadership of NIST is OSAC, charged with providing practice-based (as opposed to policy-based) scientific guidance to each forensic science discipline.

While NCFS and OSAC are separate organizations, NIST and DOJ achieve coordination through the mechanisms stated in their Memorandum of Understanding (MOU), the purpose of which is:

> [T]o outline the framework or cooperation and collaboration between DOJ and NIST in support of the objectives of the national commission on forensic science (Commission), which will develop a national forensic science guidance and policy recommendations for consideration by the Attorney General, and the Organization of Scientific Area Committees (OSAC) which will facilitate the development of voluntary consensus standards for forensic practitioners. [5]

The MOU essentially provides that the Commission (NCFS) will provide policy recommendations to the Attorney General, OSAC will share its findings with the forensic disciplines that it serves, and the efforts of both the NCFS and OSAC will be coordinated by designated officials in the DOJ and NIST.

3. Membership, Objectives, and Duties of the NCFS

The NCFS consists of approximately 30 members selected to achieve a balance of representation and expertise from "scientific, legal, law enforcement, academic, and advocacy professions."[6] As such, its members include "federal, state and local forensic science service providers; research scientists and academics; law enforcement officials; prosecutors, defense attorneys and judges; and other stakeholders from across the country."[7] One senior official from each of the DOJ and NIST are the co-chairs of the NCFS. The Commission's membership include Gregory Czarnopys, Deputy Assistant Director, Office of Science and Technology, Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF); Peter Neufeld, Co-Founder of the Innocence Project; and Paul C. Giannelli, Distinguished University Professor of Law at Case Western Reserve University. While all of the commissioners are well-regarded professionals who are knowledgeable about various aspects of forensic science, we single out these three members because of connections they have with fire investigations:

- Gregory Czarnopys is a representative of the ATF on the NCFS. The ATF has a long-standing and close relationship with the IAAI as evidenced by its work with the IAAI in developing CFITrainer.net, and the involvement of ATF special agents in the IAAI leadership including President Daniel Heenan, past presidents, board members, and committee members.
- Peter Neufeld is a Co-Director of the Innocence Project, which helped to establish the Innocence Network that extends across the United States and Canada, and which have put a spotlight on wrongful arson convictions. [9]
- Paul Giannelli is a law professor whose works have cast a critical eye on reliability issues in arson investigations.[10]

Biographies of all members of the NCFS and its staff support are available on the "Members" page of the NCFS website: http://www.justice.gov/ncfs/members.

The objectives of the NCFS include recommending scientific protocols for how forensic evidence is seized, tested, analyzed and reported. Further, advising the Attorney General on how the forensic science communities can improve the validity and reliability of their work, as well as addressing the growing demands of the civil and criminal justice systems on the forensic sciences at the federal, state, and local levels.[11] To carry out these objectives, some of the duties of the NCFS are:

- "To recommend priorities for standards development to the Attorney General;"
- "To develop proposed guidance concerning the intersection of forensic science and the courtroom;"
- "To develop policy recommendations, including a uniform code of professional responsibility and minimum requirements for training, accreditation and/or certification;"
- "To identify and assess the current and future needs of the forensic sciences to strengthen their disciplines and meet growing demands."[12]

The NCFS carries out its objectives and duties in a structured fashion. Here is a very simplified overview o7f the NCFS procedures. Meeting agendas are set by the DOJ and NIST co-chairs with the Commission's input. Issues addressed are largely driven by the *NRC/NAS Report* recommendations. At each meeting, the NCFS hears presentations from experts in various fields of the forensic sciences as well as experts from NIST, the DOJ, or elsewhere on topics related to agenda items. Tasks are identified by the NCFS and assigned to its subcommittees. Subcommittees are composed of NCFS members and members of the public, appointed to ensure a balance of interests and sufficient subject-matter expertise. Written procedures prescribe the steps required for work products to move from draft form, through a public comment period, into final form where they are voted on by the full Commission. Work products approved by the commission are then submitted to the Attorney General for review and action.[13]

. . . continued on page 42

Detailed information on the Commission's structure and procedures are contained in its governing documents: its Charter and Bylaws. The mandate and members of each subcommittee are available on the Subcommittees page of the NCFS website. Work products, available for review in draft form for public comment and in final form as approved by the NCFS are available on the website's Work Products page.

As a federal advisory commission, the work and meetings of the NCFS require transparency. Thus, its meetings must be open and available to the public. Approximately 100 members of the public attend each of its four meetings a year. Meeting agendas, videos, and written summaries of its meetings are posted on the NCFS website.

Photo of a meeting of the NCFS, courtesy NIST.[14]

As mentioned, the Commission's draft and final work products are also available online.[15] Below are some of the work products that the NCFS has approved and forwarded to the Attorney General. We have selected ones that likely to affect fire investigators. Beside the title of each work product is the nickname of the *NRC/NAS Report* recommendation to which it relates.

1. **Defining Forensic Science and Related Terms *(All NRC/NAS Report Recommendations)*:** Unless otherwise provided in specific work products, the NCFS has defined its use of the phrase "forensic science" and related terms. In reading the following definitions, we invite you to remember that two industry standards identify the basic methodology for the conduct of fire investigations: *NFPA 921 Guide for Fire and Explosion Investigations (NFPA 921) and NFPA 1033 Standard for Professional Qualifications for Fire Investigator (NFPA 1033).* In both NFPA 1033 and in NFPA 921 the basic methodology for the fire investigator is the scientific method for the purpose of collecting and analyzing evidence in order to prepare reports and render opinions respecting the origin and cause of fires.[16] With this in mind, it is reasonable to assume that the following definitions are broad enough to encompass fire investigators and those that employ them.

   Forensic Science — The application of scientific or technical practices to the recognition, collection, analysis, and interpretation of evidence for criminal and civil law or regulatory issues.

   Forensic Science Service Provider — A forensic science agency or forensic science practitioner providing forensic science services.

   Forensic Science Agency — An organization in the public or private sector that employees forensic science practitioners and issues reports prepared by forensic science practitioners.

   Forensic Science Practitioner — An individual who (1) applies scientific or technical practices to the recognition, collection, analysis, or interpretation of evidence, and (2) issues test results, provides reports, or provides interpretations, conclusions, or opinions through testimony with respect to such evidence.

   In considering these definitions, it is noteworthy that some of the Commission's work products implicitly exclude application to fire investigators by referring to "forensic laboratories" and the like. This means that not all of its work products apply to fire investigators. It appears that the work products listed below will likely be applied to fire investigators, though time will tell just how the fire investigation community is affected.

2. **Universal Accreditation for Forensic Science Service Providers (FSSPs) *(Mandatory Accreditation & Certification):*** The NCFS has approved a policy recommendation that "all FSSPs become accredited" (w/in 5 years.) FSSPs are defined to include entities providing fire investigation services, including sole practitioners. This Universal Accreditation initiative and its implications for fire investigators was addressed by the FISC Bulletin Board in the April 2015 issue of the *Fire & Arson Investigator Journal* and can be accessed by IAAI members on the IAAI website.[17] The Universal Accreditation Recommendation in its final form is available on the "Work Products" page of the NCFS website.

3. **Scientific Literature Views Document *(Foundational Research)*:** The NCFS has stated that it is of the view that each forensic discipline must have a foundation resulting from a vigorous vetting process captured in peer-reviewed scientific literature. A comprehensive evaluation of scientific literature is critical. Foundational scientific literature in support of a discipline should meet specific criteria, *i.e.* it must be:

a) Peer reviewed in the form of original research, substantive reviews of original research, or reports of consensus development conferences;

b) Published in a book or journal with an ISSN or ISBN number and by recognized authors (books) or editorial board (journals);

c) Published in a journal with rigorous peer review by external reviewers to validate accuracy, and;

d) Published in a journal that is searchable using free publically available search engines and that is indexed in databases available through academic libraries.

4. **Pretrial Discovery of Forensic Materials Views Document *(Standardized Terminology & Reporting)*:** The NCFS is of the view that the following recommendations, (as quoted directly from the document), should be implemented:

a) When a party proposes to use forensic evidence in a criminal case, the adversary party should be provided with access to the underlying items examined (if reasonably available) as well as with detailed information about the kinds of analysis conducted and methods used to evaluate those items; testing conducted on those items; the observations made; the opinions, interpretations, and conclusions reached; and the bases for those observations, opinions, interpretations, and conclusions.

b) Access to such information should be made in sufficient time for the adversary party to make effective use of it.

c) Access to such information should be equally available to both sides, regardless of which side is proposing to use the evidence.

d) Access to such information should be enforceable by the parties through the courts.

In order for these recommendations to come into effect, they will require action by the Attorney General insofar as it affects federal agencies and prosecutors. To see these changes take place in a broader context they would require changes in federal and state rules of evidence and rules of criminal procedure. Therefore, while changes in disclosure of forensic evidence will not be immediate, it is probably safe to assume these recommendations are a harbinger of things to come.

5. **Universal Accreditation of Medical Examiner/ Coroner Offices *(Medicolegal Death Investigations)*:** In addition to work products relevant for fire investigators, the NCFS deals with other issues including medical examiner and coroner offices. The NCFS has approved a policy recommendation calling for universal accreditation of all medical examiner and coroner offices, which provides that "all offices, facilities, or institutions performing government-funded official medicolegal death investigation activities, for medical examiner/coroner system, be accredited by the end of the year 2020."

   According to information on the NCFS website, relatively few medical examiner and coroner offices are currently accredited and accreditation can be a very time-consuming and costly affair. To the extent that a fire investigation involves a fatality, this policy recommendation has the potential to affect fire investigators and their cases. One can imagine how a criminal defense lawyer could make an issue of perceived weaknesses in evidence from a non-accredited medical examiner or coroner office, thereby potentially jeopardizing a prosecution case.

There are many other NCFS projects relating to *NRC/NAS Report* recommendations that are either underway or in the offing.[18] They include, among other things:

- A draft universal Code of Professional Responsibility for forensic practitioners (re: recommendation 9 for a National Code of Ethics);
- A document expressing the Commission's view that experts should not express their opinions in terms of a "reasonable scientific certainty," what should be contained in forensic reports, and limits on expert testimony governing both experts and attorneys (re: Standardized Terminology and Reporting);[19]
- A directive recommendation that the DOJ fund a national forensic science curriculum for the training of judges and lawyers and others on forensic science issues expected to be brought before the courts (re: Training & Education).[20]

The delivery of work products is escalating as subcommittees complete their work. To track developments, visit the NCFS website. However, be forewarned: there is a plethora of information available and a significant investment of time is necessary to work through the materials and identify the implications for fire investigators.

The NCFS is a limited term Federal Advisory Committee. Its first charter extended from April 2013 to April 2015, at which time its mandate was renewed for a further two years. It has the potential to effect broad-ranging changes on forensic sciences and the courts, including rules of evidence and procedure, particularly within the criminal justice system.

4. Goals, Membership, and Structure of OSAC

Practice-related overhauls in the forensic sciences are being spearheaded by NIST. NIST has put together experts in the forensic science disciplines in a new infrastructure implemented in early 2014 under the title "Organization of Scientific Area Committees" (OSAC).[21] The overall objectives of NIST's OSAC are, "To create a sustainable infrastructure that produces *best practices, guidelines, and standards* to improve quality and consistency of work in the forensic science community." [Emphasis added.] [22]

OSAC consists of a series of discipline-specific committees of experts, which builds on the work of pre-existing Scientific Working Groups, called SWGs (pronounced Swigs). Over time, more than 20 such working groups were formed across the forensic disciplines. They determined best practices and developed or contributed to consensus standards such as those produced by the ASTM International, a standards development organization, (ASTM). Two such working groups addressed issues pertaining to fire and explosion investigations and related laboratory analyses. These two working groups are known as TWGFEX (the fire scene investigation group) and SWGFEX (the fire debris and explosives debris lab group), and are together known as the Technical and Scientific Working Group on Fires and Explosions (T/SWGFEX). Dating back to the mid-1990s, FISC Bulletin Boards reported on the work of T/SWGFEX.

. . . continued on page 44

In 2013, NIST and the DOJ created OSAC to provide a cohesive and comprehensive response to the NRC/NAS Report. This decision was in part in response to the recognition of weaknesses in the underpinnings of the SWGs, such as:[23]

- They have no clear or regular source of funding & meetings are irregular;
- There are no clear standards for membership common to all SWGs;
- Neither the SWGs nor their recommendations are mandated by federal or state laws or regulations;
- SWG recommendations and guides not enforceable, and;
- There is no mechanism to measure impact of SWGs.

The DOJ and NIST therefore decided to incorporate the efforts made by the SWGs into a unified body through OSAC. Some of the SWGs, including T/SWGFEX have continued, with some of their members also serving on OSAC. While T/SWGFEX continues to exist, its last federal funding was from NIST in 2013.

NIST decided to unify the efforts of the individual SWGs within a common framework with consistent funding from a single source. It explained this decision by using the analogy of uniting the efforts of many small SWG rowboats into one big OSAC ship, as shown in Figure 1.

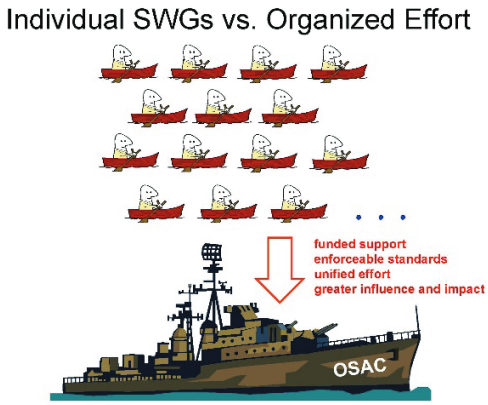


Figure 1: Courtesy of Mark Storolow, Director of OSAC Affairs, NIST, in his presentation to the NCFS on Feb. 4, 2014.

OSAC's overarching goal is to create two registries, one consisting of Approved Standards and a another of Approved Guidelines. This goal has been summarized in this way: [24]

> The aim of the Organization of Scientific Area Committees for Forensic Science (OSAC) is to identify and promote technically sound, consensus-based, fit-for-purpose documentary standards that are based on sound scientific principles. This will be achieved through the OSAC Registry of Approved Standards and the OSAC Registry of Approved Guidelines. A standard or guideline that is posted on either 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.

The standards and guidelines in the registries will have several uses. Forensic practitioners can use them to improve the reliability and validity of their analyses; judges and lawyers can use them in court to evaluate opinions of forensic experts, and accreditation bodies can use them to audit forensic science service providers[25] to ensure they meet the required standards of practice.

We will address the standards and guidelines relevant to fire investigators that have been submitted for inclusion in the registries later in this article. First, let us review the overall structure of OSAC.

The members of OSAC will consist of "600 forensic science practitioners and other experts who represent local, state, and federal agencies; academia; and industry."[26] The structure of OSAC is hierarchical. At the top of the OSAC hierarchy (shown in the center of Figure 2 and at the top of Figure 3) is the Forensic Science Standards Board (FSSB), which provides oversight for all of the committees subcommittees in OSAC and ultimately approves documents that will go into the registries. Three resource committees provide input to the FSSB: A Quality Infrastructure Committee (QIC), a Legal Resource Committee (LRC), and a Human Factors Committee (HFC). These resource committees provide direction and guidance to the FSSB respecting the overall OSAC organization. Five Scientific Area Committees (SACs) coordinate the discipline-specific work of OSAC. These are: (1) Biology/DNA, (2) Chemistry/Instrumentation, (3) Crime Scene/Death Investigation, (4) Information Technology/Multimedia, and (5) Physics/Pattern. Under each SAC are 24 (soon to be 25) sub-committees. More information about the authority and duties of each component of OSAC's structure is available through the OSAC *Roles and Responsibilities* page, available on the NIST-OSAC website.

In Figure 2 one can see OSAC's organizational structure in a graphical depiction. Figure 3 shows the same information in a traditional organizational chart.

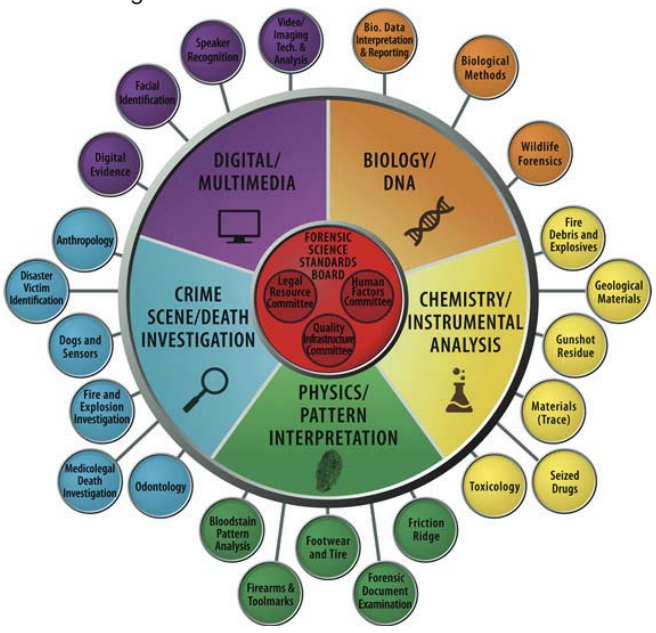


Figure 2: OSAC Graphic courtesy of NIST, available at http://www.nist.gov/forensics/osac/.

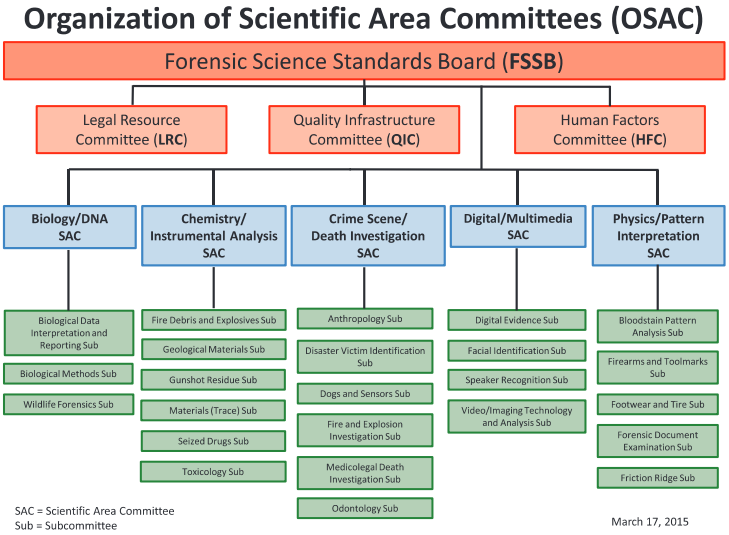


Figure 3: OSAC Organizational Chart courtesy of NIST, available at http://www.nist.gov/forensics/osac/upload/OSAC-Block-Org-Chart-3-17-2015-2.pdf.

Of most interest to IAAI members will be the work of two OSAC subcommittees:

1) The Fire and Explosions Subcommittee, which is part of the Crime Scene/Death Investigation SAC and is the subject of the next section of this article, and;
2) The Fire Debris and Explosives Subcommittee, which is part of the Chemistry/Instrumental Analysis SAC and focuses on "standards and guidelines related to the scientific examination and analysis of materials associated with fire and explosion investigations,"[27] including the laboratory analysis of fire debris and explosives residue.

One can see where these subcommittees and their respective SACs are located in the OSAC hierarchy.

IAAI members may also be interested to know that OSAC has announced that it is recruiting members for a new subcommittee: the Crime Scene Subcommittee. This new subcommittee will become part of the Crime Scene/Death Investigation SAC and will concentrate on "the standards and guidelines related to the investigation of crime scenes including the search for, documentation of, collection of, and preservation of evidence associated with a crime scene." [28]

4.1. OSAC's Fire and Explosion Investigation Subcommittee

The OSAC Fire and Explosion Investigation Subcommittee addresses matters relating to the investigation, analysis, and interpretation of fire and explosion incidents. Its overall objective is to improve and enhance the practice of fire and explosion investigation through an assessment of all elements of the forensic system that have a role in establishing and implementing investigation methods and managing errors.

The subcommittee's chair is Craig Beyler, Ph.D., Technical Director Emeritus at Jensen Hughes. Of its 20 members,[29] many are IAAI members and past or present members of the NFPA 921 Technical Committee. For example, Charles R. (Randy) Watson, is the Chair of the NFPA 921 Committee and a member of the Board of Directors of the IAAI. Task Group Chairs Philip Crombie and John Lentini are also IAAI members and NFPA 921 members, and Task Group Chair Gregory Gorbett is an IAAI member. A full list of the membership of this subcommittee is listed in endnote 29 of this article. Below is a photograph of the subcommittee at their meeting in January 2016.

Photo of the Fire and Explosion Investigation Subcommittee and invited guests, courtesy of NIST, taken at OSAC's meeting in Leesburg, VA, January 2016 available at http://www.nist.gov/forensics/osac/sub-fire-scene.cfm.

One of the subcommittee's top priorities was to identify standards and guidelines that should be included in the Registry of Approved Standards and Registry of Approved Guidelines. The objective is to identify standards and guidelines that "define a scientifically based investigation methodology for fire and explosions," or that "establish qualifications required by investigators." [30] The subcommittee voted to submit eight documents for consideration by the FSSB for inclusion in the registries. Each of these documents are consensus-based industry standards that were developed by two standards development organizations (SDOs): the National Fire Protection Association (NFPA) and ASTM. Table 2 lists these documents.[31]

Table 2: Documents Recommended by OSAC Fire and Explosion Subcommittee for Inclusion in Registries

Title and Edition	SDO
Guide for Fire and Explosion Investigations, 921, 2014	NFPA
Standard for Professional Qualifications for Fire Investigator, 1033, 2014	NFPA
Standard Practice for Examining and Preparing Items that Are or May Become Involved in Criminal or Civil Litigation, E 860, 2007 (2013)	ASTM
Standard Practice for Evaluation of Scientific or Technical Data, E 678, 2007	ASTM
Standard Practice for Reporting Opinions of Scientific or Technical experts, E620, 2011	ASTM
Standard **Guide** for Physical Evidence Labeling and Related Documentation, E1459, 2013	ASTM
Standard Practice for Collection and Preservation of Information and Physical Items by a Technical Investigator, E1188, 2011	ASTM
Standard Practice for Reporting Opinions of Technical Experts, E1020, 2013	ASTM

. . . continued on page 46

Four additional priorities are currently under consideration by the Fire and Explosion Investigation subcommittee. Each topic has been assigned to a corresponding task group. Below is a list of each topic, the relevant *NRC/NAS Report* recommendations, and a summary of task group activities: [32]

1. **Competencies** (Re: *NRC/NAS Report* recommendations 7 - Mandatory Accreditation & Certification, and 10 - Training & Education): This task group is:
   - Evaluating the educational requirements and competencies required to perform the job of a fire investigator including certifications and formal education;
   - Developing proposals for training and professional competencies which they expect to submit for the next edition of NFPA 1033 (revision cycle beginning in 2017 for the 2020 edition).
2. **Documentation and Report-Writing** (Re: *NRC/NAS Report* recommendation 2 - Standardized Terminology & Reporting): This task group is:
   - Reviewing current guidelines on documentation and report content;
   - Developing recommendations about requirements for documentation and reports;
   - Developing model investigation reports, and;
   - Preparing proposals for future editions of NFPA 921 and NFPA 1033.
3. **Comparative Analysis of Relevant Standards** (Re: *NRC/NAS Report* recommendation 6 - Best Practices & Standards): This task group is:
   - Identifying gaps that may exist and enhancements that can be made in current processes, methodology, and competencies required of investigators;
   - Conducting a gap analysis of NFPA 921, NFPA 1033, NFPA 1730 *Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations,* and NFPA 1037 *Standard on Fire Marshal Professional Qualifications;* [34]
   - Developing proposals to relevant NFPA and ASTM documents where the scientific basis exists, and;
   - Providing input to the Research Agenda task group where gaps cannot be filled with existing science.
4. **Research Agenda** (Re: *NRC/NAS Report* recommendation 3 - Foundational Research): This task group is reviewing state-of-the-art fire and explosion investigation science and related fire and explosion scientific literature. It is also developing a research agenda that addresses needs in methodologies and processes for fire and explosion investigations.

A meeting of the Fire and Explosion Subcommittee was held in January 2016 at the full OSAC meeting in Leesburg VA. OSAC then held public sessions in conjunction with the annual meeting of the American Academy of Forensic Sciences in Las Vegas NV in February 2016 to report the progress of each subcommittee. The Crime Scene/Death Investigation SAC (together with the Fire and Explosion Investigation Subcommittee) held its public session from on Monday, February 22nd, 2016 and the Chemistry/Instrument Analysis SAC (together with the Fire Debris and Explosives Subcommittee) held their public session on Tuesday, February 23rd, 2016.[35]

For more information about OSAC, its committees and subcommittees, visit the NIST-OSAC homepage at http://www.nist.gov/forensics/osac/. If you would like to receive this monthly newsletter and learn about upcoming public comment periods and other OSAC news, insert your e-mail address in the field shown on the home page.

4.2. OSAC's Vision of Success

Here are highlights of OSAC's long-term goals, to be achieved in the next five to 10 years: [36]

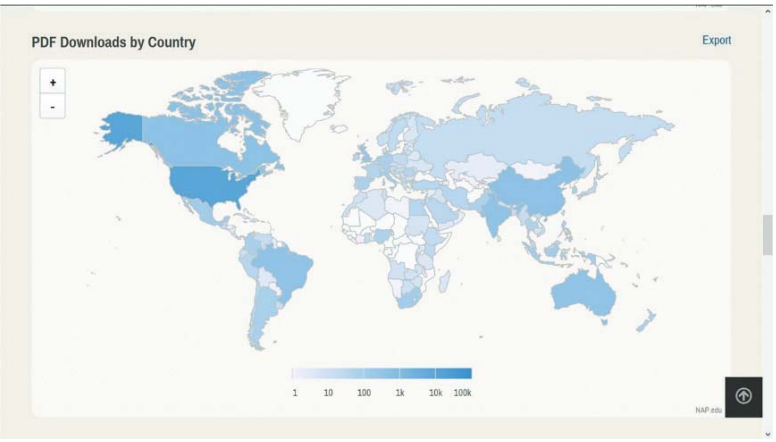
- Forensic science practitioners embrace change
- OSAC Forensic Registries of Standards and Guidelines become implemented in the practice of forensic science across all forensic disciplines
- Prosecutors, defense attorneys and judges begin to use the Registries of Standards and Guidelines in direct and cross examinations of expert witnesses
- Judges and Juries routinely hear witnesses testify about how their analysis met current standards and are scientifically valid, as well as openly describing the limitations of the tests in general and their interpretations in the specific case
- Significant forensic science research is finally well organized and well funded with influence from OSAC to define research priorities
- Standards enforcement by accrediting bodies finally becomes the rule rather than the exception

These goals will serve to heighten even further the use of NFPA 921, NFPA 1033, and ASTM standards in fire investigations and in court—topics of many past FISC Bulletin Boards.

5. International Perspectives

As apparent from its title, "Strengthening Forensic Science in the United States . . ." the *NRC/NAS Report* Report is concerned with problems in the forensic sciences in the United States. However, issues plaguing forensic sciences are not limited to America, which explains in part why this report has gained international recognition. As of the statistics posted in mid-March 2017, over 17,000 PDF copies of the *NRC/NAS Report* have been downloaded. Figure 4 shows the downloads worldwide. By visiting the National Academies Press website, you can click on any area of the map to see the number copies download in each country. Another graphic on that website shows the rapidly rising escalation of downloads over time.

Figure 4: PDF Downloads of Strengthening Forensic Science in the United States: A Path Forward (2009) as of March 2016.



Insofar as some of the issues addressed in the report relate to the administration of justice, it is no surprise that the *NRC/NAS Report* is receiving attention in other common law jurisdictions with a legal system similar to that in the United States. These jurisdictions include England and Wales, Canada, and Australia, as one can see from the map in Figure 4.

The international attention received by *NRC/NAS Report* has not not been limited to a mere passing interest, but extends to lessons it holds for other countries and lessons other countries can provide to help implement its recommendations in the United States. Here are a few examples:

- In 2011 the Canadian government published it's report, *Path to Justice: Preventing Wrongful Convictions*, in which the importance of the *NRC/NAS Report* was considered in the section on "International Perspectives." [37]
- In 2013 as NIST was gathering suggestions and information on how to move forward with the formulation of guidance groups (similar to SWGs—which would ultimately become OSAC), it published a public Notice of Inquiry to solicit ideas. 82 responses were received, including input from the United Kingdom, Canada, Germany, and Australia. [38]
- In implementing the recommendations of the *NRC/NAS Report*, the NCFS and OSAC have looked to other countries for solutions. For example, at its third meeting Mr. Andrew Rennison, the then Forensic Science Regulator from the Home Office of the Government of the United Kingdom presented Lessons Learned from the United Kingdom. As for OSAC's Fire and Explosion Investigations Subcommittee, it is looking to Australian standards for ideas and materials that may improve standards utilized by American investigators.
- Foreign experts are welcome to be involved in the process and may attend OSAC subcommittee meetings as invited guests or affiliates. The Fire Debris and Explosive Subcommittee, for example, has benefited from the participation of international participants.

As has been said, the world is a global village. It will be interesting to track the ripple effect of the *NRC/NAS Report* in the United States and elsewhere over time.

6. Conclusion

Industry standards for fire investigators, such as those published by the NFPA and ASTM, have been a topic of discussion for many years. Now, with the growing influence of the *NRC/NAS Report* through the works of NCFS, OSAC, and others, a solid infrastructure is being built around these standards that will significantly influence the field of fire investigations and surrounding legal issues. If this article has but one message, it is this: Now is the time to embrace change!

In that vein, we encourage you to take the opportunity to learn more about the topics of certification and accreditation because they relate to important projects of both NCFS and OSAC. To this end, through CFITrainer.net, IAAI members have produced a new module on *Accreditation, Certification, and Certificates.* This module helps investigators to understand the difference between a "certificate" issued upon completion of a training, and a "certification," which is an indicator that an investigator has satisfied certain competencies necessary for his or her job duties. The module further explores the role of accreditation in certification programs. This module is available to anyone, free of charge. Just login to www.CFITrainer.net to take this module.

We trust you find the issues covered in this article as interesting as we do, and welcome your feedback and ideas for future FISC Bulletin Boards. [39]

Acknowledgements

Thanks to the FISC members for their continued work of suggesting ideas for this column and writing or reviewing drafts. These FISC members are: Steven J. AVATO, Mark A. BEAVERS, Ross BROGAN, Mike DONAHUE, Mike HIGGINS, Rick JONES, Raymond J. KUK, Glenn LAUPER, Hal C. LYSON, Peter MANSI, Major J. Ron McCARDLE, Wayne J. McKENNA, Rick MERCK, Angelo PISANI, Jr., Christopher D. PORRECA, Gerard H. (Jerry) RUDDEN, Joe SESNIAK, Amanda SILVA, Mark A. TEUFERT, Joe TOSCANO, George A. WENDT, Jeff WILLIAMS.

Special thanks to Ray Kuk and Peter Mansi for information on international issues. Also, many thanks to Dr. Craig Beyler, Chair of OASC's Fire and Explosion Investigation Subcommittee for permission to share the information from his two PowerPoint reports: one that he delivered to the NFPA 921 Technical Committee in San Antonio TX on April 28, 2015, and a second that John Lentini delivered at the OSAC public meetings held at the American Academy of Forensic Sciences annual meeting in Las Vegas NV on February 22, 2016.

. . . continued on page 48

Endnotes

1 Comm. on Identifying the Needs of the Forensic Sci. Cmty. *et al.*, Nat'l Research Council of the Nat'l Acads., Strengthening Forensic Science in the United States: A Path Forward (2009), *available at* https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf [hereinafter NRC/NAS Report].

2 The recommendations in this table are adapted from the summaries of the recommendations of the NRC/NAS Report (*supra* note 1, at 21-30) created by John Butler, Special Assistant to the Director for Forensic Science, Office of Special Programs, at NIST in John M. Butler, *U.S. Initiatives to Strengthen Forensic Science & International Standards in Forensic DNA*, 18 FSI Genetics 4 (Sept. 2015).

3 Time will tell whether this recommendation will be broadened to apply to organizations other than just forensic laboratories, such as organizations providing forensic science services such as fire, police, and insurance investigation units.

4 Terry-Dawn Hewitt & Wayne J. McKenna, *A Perfect Storm Brewing for Fire Investigators in Court* (2014, 79 pgs.), available for free download from the Legal Scholarship Network: http://ssrn.com/abstract=2381519.

5 Memorandum of Understanding Between the Department of Justice and The National Institute of Standards and Technology In Support of The National Commission on Forensic Science and The Organization of Scientific Area Committees, August 2015, para. II.

6 U.S. Dept. of Justice, Charter Nat'l Comm'n on Forensic Sci., (Renewed Apr. 23, 2015) para. 12, *available at* http://www.justice.gov/ncfs/file/624216/download (last visited Mar. 15, 2016) [hereinafter NCFS 2015 Charter].

7 *NCFS Home*, Nat'l Comm'n on Forensic Sci. (2015), http://www.justice.gov/ncfs (last visited Mar. 15, 2016).

8 NCFS Charter, *supra* note 6.

9 *See, e.g.* Innocence Project Arson Review Comm., Report on the Peer Review of the Expert Testimony in the Cases of *State of Texas v. Cameron Todd Willingham* and *State of Texas v. Ernest Ray Willis* (2006), *available at* http://www.innocenceproject.org/files/imported/arsonreviewreport-7.pdf.

10 *See*, *e.g.* Paul C. Giannelli, The Execution of Cameron Todd Willingham: Junk Science, an Innocent Man, and the Politics of Death, (August 26, 2011) *available at* http://works.bepress.com/paul_giannelli/2/; *and* Paul C. Giannelli & Kimberly Gawel, *Arson Evidence*, 47 No. 6 Crim. Law Bulletin ART 8, 8 ("Arson investigations continue to come under attack.").

11 NCFS Charter, *supra* note 6 at para. 3.

12 NCFS Charter, *supra* note 6 at para. 4.

13 For detailed information about the NCFS procedures and governing documents, meetings, and work products, *see* the links on the NCFS homepage: *Home*, Nat'l Comm'n on Forensic Sci. (2015), http://www.justice.gov/ncfs (last visited Mar. 15, 2016).

14 *Forensic,* NIST, http://www.nist.gov/forensics/ncfs.cfm (last visited Mar. 15, 2016).

15 *NCFS Work Products*, Nat'l Comm'n on Forensic Sci. (2015), http://www.justice.gov/ncfs/work-products-adopted-commission (last visited Mar. 15, 2016).

16 Nat'l Fire Prot. Ass'n Technical Comm. on Fire Investigator Professional Qualifications, NFPA 1033 Standard for Professional Qualifications for Fire Investigator [hereinafter NFPA 1033] § 4.1 (2014 ed.). Nat'l Fire Prot. Ass'n Technical Comm. on Fire Investigations, NFPA 921 Guide for Fire and Explosion Investigations [hereinafter NFPA 921] § 4.1 – 4.4 (2014 ed.).

17 Terry-Dawn Hewitt & Wayne J. McKenna, *Trending: Universal Accreditation for Public and Private Fire Investigation Service Providers*, Fire & Arson Investigator Journal, vol. 65 no. 4, p. 33, available at: https://www.firearson.com/uploads/FAI-2015/FAI-April2015.pdf (IAAI member sign-in required).

18 *See* NCFS, *Meeting #7 Summary*, Aug. 10-11, 2015 *available at* http://www.justice.gov/ncfs/file/778926/download.

19 *See* NCFS, *Meeting #7 Summary*, Aug. 10-11, 2015 *available at* http://www.justice.gov/ncfs/file/778926/download.

20 NCFS, *Recommendation on Forensic Science Curriculum Development* (Adopted at NCFS Meeting #8, Dec. 8, 2015) *available at* https://www.justice.gov/ncfs/work-products-adopted-commission.

21 NIST, *Updated Summary of the NIST Proposed Plan for the Organization of Scientific Area Committees*, Mar. 18 2014, available at http://www.nist.gov/forensics/osac.cfm (last visited Mar. 15, 2016).

22 *Id.*

23 Adapted from the statement of Hon. Harry T. Edwards before the U.S. Senate Committee on the Judiciary, Mar. 18 2009 (speaking in his capacity as Co-Chair of the Committee that authored the NRC/NAS Report).

24 NIST, *OSAC Registry of Approved Standards and OSAC Registry of Approved Guidelines*, last updated Feb. 18, 2016, *available at* http://www.nist.gov/forensics/osac/osac-registries.cfm (last visited Mar. 15, 2016).

25 John M. Butler, *The National Commission on Forensic Science and the Organization of Scientific Area Committees*, Proceedings of the International Symposium on Human Identification (2014), at 1, available at http://www.promega.com/products/pm/genetic-identity/ishi-conference-proceedings/proceedings-index-home/.

26 NIST Organization of Scientific Area Committees Roles and Responsibilities, *Overview, available at* http://www.nist.gov/forensics/osacroles.cfm (last visited Mar. 15, 2016)

27 *Fire Debris and Explosives Subcommittee*, NIST-OSAC, http://www.nist.gov/forensics/osac/sub-fire-debris.cfm (last visited Mar. 15, 2016). FISC member Ray Kuk, Section Chief, Arson & Explosives II Bureau of Alcohol, Tobacco, Firearms & Explosives, is an affiliate of the Fire Debris and Explosives Subcommittee.

28 NIST-OSAC, *OSAC Recruiting Applicants for New Crime Scene Subcommittee*, (Oct. 29, 2015) http://www.nist.gov/forensics/osac/osac-recruiting-applicants-for-new-crime-scene-subcommittee.cfm.

29 The OSAC website lists (http://www.nist.gov/forensics/osac/sub-fire-scene.cfm) the following OSAC Fire and Explosion Investigation Subcommittee members as of January 2016: Craig Beyler, Ph.D., Subcommittee Chair, Jensen Hughes, Steve Campolo, Leviton Manufacturing Company, Inc., Steven Carman, Carman and Associates Fire Investigation, Inc., Chris Connealy, Texas State Fire Marshal's Office, Philip Crombie, Jr., Travelers Insurance, Scott Davis, Ph.D., GexCon US, John Golder, U.S. Bureau of Alcohol, Tobacco, Firearms and Explosives, Mark Goodson, Goodson Engineering, Gregory Gorbett, Ph.D., Eastern Kentucky University, Eve Hinman, Ph.D., Hinman Consulting Engineers, Mark Johnson, Ph.D., University of Central Florida, John Lentini, Scientific Fire Analysis, LLC, David McCollam, U.S. Federal Bureau of Investigation, Elayne Pope, Ph.D., Office of the Chief Medical Examiner, Tidewater District, Virginia Department of Health, Melvin Robin, U.S. Bureau of Alcohol, Tobacco, Firearms and Explosives, David T. Sheppard, Ph.D., ATF Fire Laboratory, Michael T. Truebenbach, FBI, Matthew Varisco, U.S. Bureau of Alcohol, Tobacco, Firearms and Explosives, Charles "Randy" Watson, SEA Ltd., and Chad Wissinger, Ohio Division of State Fire Marshal Forensic Laboratory.

30 Craig Beyler, *Priority Action Report, Fire and Explosion Investigation Subcommittee*, (Jan. 30, 2016) slide 6, delivered by John Lentini on Feb. 22, 2016 to the OSAC Public Meetings held at the American Academy of Forensic Sciences annual meeting, Las Vegas NV [hereinafter OSAC's Fire & Explosion Inv. Subcomm. Jan. 2016 Report].

31 Fire & Explosion Inv. Subcomm. Jan. 2016 Report, *supra* note 30 at slide 7.

32 Fire & Explosion Inv. Subcomm. Jan. 2016 Report, *supra* note 30 and Craig Beyler, *Status Report to NFPA 921 Committee re: OSAC Fire and Explosion Investigation Subcommittee*, (Apr. 28, 2015) [hereinafter OSAC's Fire & Explosion Inv. Subcomm. Apr. 2015 Report].

33 For free access to NFPA 1730 and more information about its technical committee and revision cycle, *see NFPA 1730 Document Information Pages*, NFPA.org, *available at http://www.nfpa.org/codes-and-standards/document-information-pages?mode=code&code=1730* (last visited Mar. 15, 2016). For a summary of NFPA 1730, *see* Terry-Dawn Hewitt & Wayne J. McKenna, *Update on NFPA 921, 2017 Edition AND Introducing NFPA 1730: A New NFPA Standard for Fire Investigation Services*, Fire & Arson Investigator Journal, vol. 66 no. 2, p. 43, available at: https://www.firearson.com/uploads/FAI-2015/FAI-Oct2015.pdf (IAAI member sign-in required).

34 For free access to NFPA 1037 and more information about its technical committee and revision cycle, *see NFPA 1037 Document Information Pages*, NFPA.org, *available at http://www.nfpa.org/codes-and-standards/document-information-pages?mode=code&code=1037* (last visited Mar. 15, 2016).

35 The authors attended these meetings.

36 Fire & Explosion Inv. Subcomm. Jan. 2016 Report, *supra* note 32.

37 Public Prosecution Service of Canada, Federal/Provincial/Territorial Heads of Prosecutions Subcommittee on the Prevention of Wrongful Convictions, *The Path to Justice: Preventing Wrongful Convictions*, Chapter 2 International Review (Fall 2011), *available at* http://www.ppsc-sppc.gc.ca/eng/pub/ptj-spj/ch2.html (last visited Mar. 15, 2016).

38 John M. Butler, *U.S. Initiatives to Strengthen Forensic Science & International Standards in Forensic DNA*, 18 FSI Genetics 4 at 6 (Sept. 2015) available at http://www.sciencedirect.com/science/article/pii/S1872497315300284.

39 If you have questions or wish to provide feedback, we invite you to contact the FISC Chair, Terry-Dawn Hewitt at TDHewitt@McKennaHewitt.com.