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FISC Bulletin Board

IAAI Fire Investigation Standards Committee (FISC)[1]

Forensic Science Developments Affecting Fire Investigators and Update on New Edition of NFPA 1033 Standard

INTRODUCTION

This issue of the FISC Bulletin Board features first a summary of developments in the field of forensic science involving fire investigators, including a brief update of the work of the Technical/Scientific Working Group of Fire and Explosions. Next is an overview of the developments in NFPA 1033 *Standard for Fire Investigator Professional Qualifications* as work towards a 2014 edition continues.

Before addressing these issues, here is a quick reminder to mark your calendars for the release of the Second Draft of NFPA 921, *Guide for Fire and Explosion Investigations*, which the NFPA will publish on July 19, 2013. It will be available as a download, free of charge, from www.NFPA.org. Click the "Codes and Standards" tab, and then open the "next edition" tab in the "document information pages" for NFPA 921.

FORENSIC SCIENCE AND FIRE INVESTIGATORS

Forensic science is very much a part of fire investigations. It is also a field that is undergoing a period of serious scrutiny that will probably lead to a marked transformation of fundamental aspects of forensic sciences. In the October, 2011 edition of the FISC Bulletin Board we introduced the 2009 report of the National Academy of Sciences (NAS) entitled *Strengthening Forensic Science in the United States (NAS Report)*.[2] The National Institute of Justice (NIJ) funded the *NAS Report*. In the course of assessing various forensic science disciplines, the *NAS Report* made brief but disturbing reference to fire scene investigations, saying:

> [M]uch more research is needed on the natural variability of burn patterns and damage characteristics and how they are affected by the presence of various accelerants. Despite the paucity of research, some arson investigators continue to make determinations about whether or not a particular fire was set. However, according to testimony presented to the committee [that prepared the *NAS report*], many of the rules of thumb that are typically assumed to indicate that an accelerant was used (e.g., "alligatoring" of wood, specific char patterns) have been shown not to be true. Experiments should be designed to put arson investigations on a more solid scientific footing.

As a result of the *NAS Report*, the Subcommittee on Forensic Science was established to advise and assist the Whitehouse through its National Science and Technology Council (NSTC)[4] and its Committee on Science (COS)[5] on "policies, procedures, and plans related to forensic science in the national security, criminal justice, and medical examiner/coroner systems at the local, state, and federal levels . . . ."[6] The Subcommittee established Interagency Working Groups (IWGs) to assist in this effort by addressing and reporting back about a number of matters. Among other issues, IWGs were asked to identify existing standards, best practices, research, guidelines, and protocols relating to forensic science disciplines.[7] They were also asked to recommend a process for defining and standardizing forensic science terminology used in expert reports and testimony.[8]

The IWGs reached out to Scientific Working Groups (SWGs), which are federally funded, each with it's own particular mission, whose members are "scientific subject-matter experts [who] collaborate to determine best practices and to develop consensus standards [as well as] . . . improve the processes within a particular area of forensic science."[9]

As of March, 2013, when this column was written, there are 20 SWGs dealing with a wide range of forensic science issues, for example, DNA evidence (SWGDAM), firearms and toolmarks (SWGGUN), and forensic document examination (SWGDOC), to name but a few.[10]

Technical/Scientific Working Group for Fire and Explosions (T/SWGFEX)

The SWG dealing with fire and explosion investigations is the Technical/Scientific Working Group for Fire and Explosions (T/SWGFEX), which is affiliated with the National Center for Forensic Science (NCFS) at the University of Central Florida in Orlando. In order to explain the assistance provided by T/SWGFEX to the work of the IWGs, we first introduce T/SWGFEX and its contributions to the fire and explosion investigation community.

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Forensic Science Developments Affecting Fire Investigators . . .

T/SWGFEX is composed of approximately 125 national and international representatives whose expertise relates to the investigation of fire and explosion scenes, as well as the collection and analysis of fire debris and explosives residues. Its members are from various professions, including forensic scientists, directors of state crime laboratories, other members of the laboratory community, fire protection engineers, fire and explosion investigators, and the legal profession. The IAAI is very well represented in T/SWGFEX. For example, the first T/SWGFEX Chair (currently Vice-Chair) is Carl Chasteen, Chief of the Florida Fire Marshal's forensic laboratory and former Chair of the IAAI Forensic Science Committee. The current TWGFEX Chair is Dennis Hilliard, Director of the Rhode Island State Crime Laboratory, an active member of the Rhode Island IAAI chapter. Members of T/SWGFEX also include IAAI past presidents, as well as many who serve the IAAI as members in leadership roles.

T/SWGFEX is unique among SWGs because it is a melding of two working groups. One is the Technical Working Group (TWGFEX) consisting of experts on the "scene" side: engineers, investigators, and others whose focus is on investigating and analyzing fire, explosion, and bombing scenes. The other is the Scientific Working Group (SWGFEX), consisting of experts from the laboratory side: forensic scientists, laboratory analysts, academics, and others involved with the forensic science and laboratory analysis of fire debris and explosives residues. These two groups combine to form T/SWGFEX and collaborate to promote best practices, guidelines, and communications on both the lab and scene side for the betterment of fire and explosion scene investigations and analysis.

Below are the mission statements for T/SWGFEX:

> The mission of TWGFEX-Scene is to establish and maintain nationally accepted programs for the forensic investigation of fire, arson, and explosion scenes and devices. Further, to promote and maintain dialogue among personnel in the public safety and legal communities.
>
> The mission of SWGFEX is to make recommendations for nationally accepted guidelines for the forensic examination of fire and explosive materials and residues.[11]
>
> T/SWGFEX accomplishes its missions through funding by various agencies[12] and the work of its committees. Every member of T/SWGFEX is on one or more committees. Examples of some of the products completed by these committees and promulgated by T/SWGFEX are:
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> - *National Needs Assessment for the Near and Long Term Future for Fire Debris and Explosives Analysis and Investigation.*[13]
> - *Fire and Arson Scene Evidence: A Guide for Public Safety Personnel.*[14]
> - *A Guide for Explosion and Bombing Scene Investigation.*[15]
> - *Instructors' Training Curriculum Guide to "A Guide for Explosion and Bombing Scene Investigation."*[16]
> - Three databases "designed to allow rapid online searches of product information and data that can assist in the investigation and analysis of explosives and fire debris:" Ignitable Liquids Database, Substrate Database, and Smokeless Powders Database. T/SWGFEX members also partnered with two universities, the University of Maryland College Park and the University of Rhode Island, producing the shared Thermal Properties Database and Explosives Database.

In addition to the products developed by T/SWGFEX committees, its committees also promote and maintain dialogue among personnel in the public safety and legal communities, in part through online courses and symposia, and by making recommendations to organizations setting standards for fire investigations and fire debris analysis, namely the NFPA and ASTM. For more information about T/SWGFEX, including a complete list of its publications, databases, other documents, and courses, visit its website at www.twgfex.org.

Developments Following Appointment of IWGs and The Creation of a New National Commission on Forensic Science

Having introduced T/SWGFEX, we now return to the developments since the publication of the *NAS Report* including the requests made by the IWGs[19] of T/SWGFEX. One of the IWGs invited T/SWGFEX to make submissions at one of its meetings to explain the methodology of scene investigations and fire pattern interpretation, including the reliability and validity of the investigative methodologies used, along with the scientific basis of fire pattern interpretation and its admissibility under Daubert. In response to this request, T/SWGFEX made a one-half day presentation to the IWG on August 17, 2011 at the ATF Headquarters. Interestingly, the three people who made formal presentations on behalf of T/SWGFEX are also IAAI FISC members.[20]

Subsequently, in the quest to assemble existing standards, best practices, research and guidelines relating to fire investigations, fire debris and explosive residue analysis, an IWG[21] requested of T/SWGFEX a bibliography of such material. Bibliographic information was supplied and in the December 2012 T/SWGFEX meeting, committees from the lab and the scene side were tasked to continue work developing bibliographies of authoritative materials used by the lab and scene side in their investigations and analysis.

In an effort to address the issue of standardizing terminology for use in expert reports and testimony, another IWG requested from T/SWGFEX a glossary of terms. As the existing glossary on the T/SWGFEX website largely consists of laboratory terms and definitions, and forensic science terminology, T/SWGFEX is currently working on a glossary project to review and refine its existing glossary, and to expand it to include definitions for terms used by scene investigators.

In accordance with T/SWGFEX Bylaws, once the committees responsible for the bibliography and glossary projects have completed their work, they will be presented as action items for the review of all T/SWGFEX members. Once approved, these documents T/SWGFEX will post these products on its website for the benefit of the fire and explosion investigative community.

In the meantime, the mandate given to the IWGs was to have their work completed and report to the NSTC and COS by the end of 2012. While their reports are not currently available to the public, changes initiated by the *NAS Report* continue. The most recent development arising from the *NAS Report* is the joint announcement by the U.S. Department of Justice (DOJ) and NIST on February 15, 2013 that a National Commission on Forensic Science is being established "as part of a new initiative to strengthen and enhance the practice of forensic science."[22] Here is the vision of the new Commission:

> The National Commission on Forensic Science will be composed of approximately 30 members, bringing together forensic science service practitioners, academic researchers, prosecutors, defense attorneys, judges and other relevant stakeholders to develop policy recommendations for the Attorney General. The commission will consider guidance on practices for federal, state and local forensic science laboratories developed by groups of forensic science practitioners and academic researchers administered by NIST.[23]

While it is too early to predict the impact of the new Commission on fire investigations policy and best practices, this step by the DOJ and NIST indicate that the NAS Report is not going away any time soon. Staying tuned to the work of T/SWGFEX is a great way for fire investigators and other IAAI members to track developments.

NFPA 1033, 2014 EDITION UPDATE

In the July 2012 issue of the FISC Bulletin Board, we reported on the proposed changes for the 2014 edition of NFPA 1033. To recap, we analyzed the more significant changes, which fall into five categories:

1) revising section 1.3.8, newly added in the 2009 edition, which requires investigators maintain a minimum basic knowledge about a list of 13 topics,
2) amending the document's scope,
3) defining terms that are part of NFPA 1033's mandatory requirements, but were not previously defined in NFPA 1033,
4) changing the job performance requirements of Chapter 4 to divide the qualifications of fire investigators into levels or tiers (which would accord with the IAAI's creation of two levels of qualifications for investigators—the IAAI-CFI® certification and the IAAI Fire Scene Technician designation), and;
5) clarifying the duties of an investigator respecting dealing with evidence, as well as duties concerning evidence review if the scene is no longer available.

The NFPA published The Report on Comments in February 2013. In this report are published all of the public comments received by the NFPA in response to the proposed changes summarized above. The NFPA technical committee responsible for NFPA 1033 has acted on each comment and published its reasons for any public comment it did not accept. In summary, here are the actions taken by the technical committee:

- Section 1.3.8, containing the infamous "list of 13" topics of which fire investigators must maintain an up-to-date basic knowledge will be expanded to 16. The existing 13 topics remain and three additional topics are added: "fire protection systems," "evidence documentation, collection, and preservation," and "electricity and electrical systems." This section will be re-numbered 1.3.7. The Annex material relating to this paragraph even more emphatically points to NFPA 921 as a source of information about the list of 16 topics. However, it now includes a caution that NFPA 921 presents these concepts at an elementary level and that additional resources, training, and education may be needed to achieve these minimum requirements.
- The technical committee completely rejected comments suggesting a change in the job performance requirements of Chapter 4 to divide the qualifications of fire investigators into levels or tiers (which would accord with the IAAI's creation of two levels for investigators).
- The other changes alluded to above (amending the scope of NFPA 1033, amending and adding definitions, and clarifying the duties of an investigator) are not affected by actions on the public comments. These changes were discussed in more detail in the July 2012 FISC Bulletin Board.

The Report on Comments is available for download, free of charge from the NFPA 1033 Document Information Pages at **www.NFPA.org.**[24] To fully understand the effect of the Report on Comments, read it together with the Report on Proposals.[25]

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Remember that anyone can read the complete text of NFPA 1033 or NFPA 921 free of charge on the NFPA's website. Just go to **www.NFPA.org,** click on the "Codes and Standards" tab, click on the "Document Information Pages" link in the left column, either scroll down the list of "All NFPA Codes and Standards" or search for either "1033" or "921" in the search field. Once you have selected your document, click on the "Document Information" tab for the selected document. To view the current edition of that document online, scroll down and click the link. Note that you will be required to sign in to your NFPA account. It costs nothing, but you must create an account and sign in before you will have access.

CONCLUSION

If you have any questions or comments about this edition of FISC Bulletin Board, or any suggestions for future editions, please feel free to e-mail me at: TDHewitt@McKennaHewitt.com. Thank you for reading! ■

ENDNOTES

1.ACKNOWLEDGEMENTS: The author acknowledges, with thanks, the assistance of the Chair of T/SWGFEX, Dennis Hilliard in providing an overview of the interaction between the IWGs and T/SWGFEX. Also, thanks to Ron McCardle T/SWGFEX Executive Board member and FISC member for suggesting the topic of the first part of this column, and to Wayne McKenna, FISC member, for his contribution to the writing of this column. Last but not least, thanks to all of our IAAI FISC members for their ongoing input into the publication of the quarterly edition of FISC Bulletin Board for the 2012-2013 committee year: (listed alphabetically) Steve Avato, Mark Beavers, Ross Brogan, Michael Donahue, Mike Higgins, Ray Kuk, Glenn Lauper, Hal Lyson, Peter Mansi, Ron McCardle, Wayne McKenna, Rick Merck, Ted Nixon, Angelo Pisani, Jr., Chris Porreca, Jerry Rudden, Joe Sesniak, Joe Toscano, Mark Tuefert, George Wendt, and Jeff Williams.

2.Available at: http://www.nap.edu/catalog.php?record_id=12589 last visited August 19, 2011.

3. COMMITTEE ON IDENTIFYING THE NEEDS OF THE FORENSIC SCIENCES COMMUNITY, STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES, NATIONAL RESEARCH COUNCIL: A PATH FORWARD 172–3 (2009) (footnotes omitted).

4. National Science and Technology Council, Office of Science and Technology Policy (last visited March 12, 2013) http://www.whitehouse.gov/administration/eop/ostp/nstc.

5. NSTC Committee on Science, Office of Science and Technology Policy (last visited March 12, 2013) http://www.whitehouse.gov/administration/eop/ostp/nstc/committees/cos.

6. Charter of the Subcommittee on Forensic Science Committee on Science, available at http://www.whitehouse.gov/sites/default/files/microsites/ostp/forensic-science-subcommittee-charter.pdf (last visited August 19, 2011), at § B. The website where this Charter was accessed has since been taken offline.

7. Charter for the Inter-agency Working Group Research, Development, Testing, and Evaluation, available at: http://www.whitehouse.gov/sites/default/files/microsites/ostp/forensic-science-rdte.pdf (last visited March 15, 2013).

8. Charter for the Inter-agency Working Group Education, Ethics, and Terminology, available at: http://www.whitehouse.gov/sites/default/files/microsites/ostp/forensic-science-education-ethics.pdf (last visited March 15, 2013).

9. Scientific Working Groups, NIST LAW ENFORCEMENT STANDARDS (July 19, 2012) http://www.nist.gov/oles/forensics/scientific_working_groups.cfm.

10. Id. This website lists the SWGs, and provides links to the websites of most SWGs, including a link to the T/SWGFEX website at http://www.twgfex.org/.

11. Mission, T/SWGFEX http://ncfs.org/twgfex/mission.html (last visited March 13, 2013).

12. T/SWGFEX is currently funded by NIST. For more details on the various federal and state agencies and organizations that have funded T/SWGFEX since its inception in 1998, see Carl Chasteen, A History of the Technical/Scientific Working Group for Fire and Explosives Analysis (T/SWGFEX), 2 (2012) available at: http://www.ncfs.ucf.edu/twgfex/The_History_of_the_Technical_final.pdf.

13. Carl Chasteen, National Center for Forensic Science, and TWGFEX, National Needs Assessment for the Near and Long Term Future for Fire Debris and Explosives Analysis and Investigation (January, 2008) (Funded by NIJ Award 2005-MU-MU-K044, supplement No. 1, UCF Project No. 24076017) available at: http://www.ncfs.ucf.edu/twgfex/docs/TWGFEX_NEEDS_ASSESSMENT_for_the_near_and_long_term_of_fire_and_explosions.pdf.

14. Technical Working Group on Fire/Arson Scene Investigation (TWGFASI) (June 2000) available at: https://www.ncjrs.gov/pdffiles1/nij/181584.pdf. TWGFASI evolved into TWGFEX in 1998 and many of the members of TWGFASI who wrote this Guide became members of TWGFEX (Carl Chasteen, A History of the Technical/Scientific Working Group for Fire and Explosives Analysis (T/SWGFEX), 2 (2012) available at: http://www.ncfs.ucf.edu/twgfex/The_History_of_the_Technical_final.pdf.).

15. Technical Working Group for Bombing Scene Investigation (TWGBSI) (June 2000) available at: https://www.ncjrs.gov/pdffiles1/nij/181869.pdf. Many members of TWGBSI became initial members of TWGFEX (Carl Chasteen, A History of the Technical/Scientific Working Group for Fire and Explosives Analysis (T/SWGFEX), 2 (2012) available at: http://www.ncfs.ucf.edu/twgfex/The_History_of_the_Technical_final.pdf.).

16. T/SWGFEX (October 2008) available at: http://www.ncfs.ucf.edu/twgfex/docs/instructors_training_curriculum_guide_to_explosive_bombing_scene_investigation.pdf.

17. Home, T/SWGFEX http://www.ncfs.ucf.edu/twgfex/index.html (last visited March 13, 2013).

18. Both of these databases and more information about those responsible for their development are available from the T/SWGFEX Databases page, available at: http://www.ncfs.ucf.edu/twgfex/databases.html.

19. The Research, Development, Training and Education (RDT&E) Interagency Working Group (IWG) was charged by the Subcommittee on Forensic Science to perform a number of tasks, including to "[i]dentify and prioritize extant research, development, testing and evaluation" and "conduct gap analysis" in forensic science disciplines. (Charter for the Research, Development, Training and Education Inter-agency Working Group of the Subcommittee on Forensic Science, http://www.whitehouse.gov/sites/default/files/microsites/ostp/forensic-science-rdte.pdf (last visited March 15, 2013). In addressing this charge, the RDT&E IWG requested T/SWGFEX make a presentation explaining the "scientific basis and current practice" of fire and arson investigation "including burn pattern identification" and how the discipline meets the Daubert admissibility criteria. (Email from John Paul Jones, NIST, to Dennis Hilliard, Carl Chasteen, and Carrie Whitcomb, T/SWGFEX (July 12, 2011), on file with the author).

20. In-person presentations were made by FISC members Richard E. Merck P. E., Fire Protection Engineer/Fire Marshal, Montgomery County Fire and Rescue Service, Special Agent Steven J. Avato CFI, Resident Agent in Charge, Bureau of Alcohol, Tobacco, Firearms & Explosives. FISC member Terry-Dawn Hewitt, McKenna Hewitt made an online presentation and was present via web link during the meeting. Other T/SWGFEX members who attended the meeting via web link or who were involved in the preparation for the presentations are Dennis Hilliard, T/SWGFEX Chair, Carl Chasteen, T/SWGFEX Vice-Chair, Carrie Whitcomb, Director of the National Center for Forensic Science, and Tom Minnich, one of the Technical Managers for T/SWGFEX.

21. The RDT&E IWG made this request.

22. Press Release, Department of Justice and National Institute of Science and Technology Announce Launch of New Commission on Forensic Science (Feb. 15, 2013) available at http://www.nist.gov/oles/doj-nist-forensic-science021513.cfm.

23. Id.

24. NFPA 1033 Document Information Pages, "Next Edition" Tab, NFPA (2013) available at: http://www.nfpa.org/Assets/files/AboutTheCodes/1033/1033-A2013-ROC.pdf.

25. Id., available at: http://www.nfpa.org/Assets/files/AboutTheCodes/1033/1033-A2013-ROP.pdf.