

- 8. Presentation by Chairman Nizam Peerwani of the Forensic Science Commission regarding recommendations made with regards to initiatives designed to improve fire investigation activities in Texas.**

underlying scientific validity of techniques affects the interpretation of findings. (NAS Report at 218.) The FSC includes specific recommendations on training of lawyers and judges in Section XI below.

XI. DRAFT RECOMMENDATIONS

The Commission makes seventeen recommendations below regarding initiatives designed to improve arson investigation in Texas. Though these recommendations have arisen from the arson investigations in this case, they are applicable to all fire investigation activities statewide. The Commission recognizes that each recommendation is dependent upon the willingness and ability of stakeholders to implement the recommendation. To that end, the Commission requests that the SFMO (in collaboration with the Texas Commission on Fire Protection (“TCFP”) and other appropriate stakeholders) review the recommendations provided below, in conjunction with any other national best practices (*see* examples cited) and develop its own near and long-term strategic plan. Any existing SFMO strategic plans or relevant initiatives should be incorporated. The plan should include an assessment of resources and highlight any gaps that could prevent stakeholders from implementing recommendations and best practices. The plan’s timeline should be aggressive but flexible to encourage effective implementation.

RECOMMENDATION 1: ADOPTION OF NATIONAL STANDARDS

The FSC recommends that fire investigators adhere to the standards of NFPA 921. The SFMO has indicated a willingness to improve standards and public confidence in fire investigation techniques. The Commission recommends

that all SFMO fire investigators adhere to the standards of NFPA 921 and serve as a model to other local fire investigators.

The FSC notes that laboratory testing on fire debris admitted into evidence in Texas courts is already subject to accreditation. For example, the SFMO laboratory that reviews fire debris is accredited through the American Society of Crime Laboratory Directors—Laboratory Accreditation Board (“ASCLD—LAB”). At this time, there are no plans to accredit the broader field of fire investigation. One obvious benefit of accreditation is that it provides an agency with an ongoing mechanism for assessing internal performance and implementing best practices.

While accreditation may not be appropriate for fire investigation, the Commission recommends that the SFMO work in collaboration with TCFP and other agencies to develop its own strategic plan setting forth best practices in fire investigation. The plan should meet the recommended national standards that exist at the time it is completed. Examples of guiding documents for current standards include but are not limited to the current edition of NFPA 921, NFPA 1033, the National Institute of Justice’s June 2000 report entitled *Fire and Arson Scene Evidence: A Guide for Public Safety Personnel* (See Exhibit 29); and the National Center for Forensic Science (Carl Chasteen), and Technical/Scientific Working Group’s January 2008 report entitled *Fire and Explosion Investigations and Forensic Analyses: Near-and Long-Term Needs Assessment for State and Local Law Enforcement*. (See Exhibit 30.)

RECOMMENDATION 2: RETROACTIVE REVIEW

Accredited disciplines of forensic science have standards that promote the re-examination of cases when science has evolved to create a material difference in the original analysis or result. Those standards include: (1) duty to correct; (2) duty to inform; (3) duty to be transparent; and (4) implementation of corrective action. The SFMO should develop similar standards.

If new scientific knowledge develops over time that would materially change the opinions or results in a criminal investigation, the individual or agency has a responsibility to inform the parties involved or develop procedures for doing so.

RECOMMENDATION 3: ENHANCED CERTIFICATION

The primary mechanism for training and educating fire investigators in Texas is individual certification. The certification process is administered by the TCFP. Texas has two separate certification titles for fire protection personnel: fire investigator and arson investigator. The main difference between the two is that an arson investigator must be certified both as a fire investigator and as a peace officer. The Texas Commission on Law Enforcement Officer Standards and Education (“TCLEOSE”) administers peace officer certification. Below is a summary of requirements for the four existing certification levels: basic, intermediate, advanced and master.

CLASS	FIRE INVESTIGATOR	ARSON INVESTIGATOR
Basic	<p>Completion of a TCFP-approved basic training program; <u>and</u></p> <p>Successfully passing the TCFP certification exam for fire investigators.</p>	<p>Peace officer license from TCLEOSE or federal equivalent; <u>and</u></p> <p>Accreditation from International Fire Service Accreditation Congress as fire investigator or TCFP- approved basic fire investigation certificate.</p>
Intermed.	<p>Prerequisite of basic fire investigator certification; <u>and</u></p> <p>4 years of fire protection experience <u>and either</u>:</p> <ul style="list-style-type: none"> • 6 semester hours of fire science or fire technology from an approved Fire Protection Degree Program; <u>or</u> • Acceptable combinations of coursework from either “A-List” or “B-List” courses (<i>See Exhibit 31</i>); <u>or</u> • Acceptable combination of college courses with either “A-List” or “B-List” courses. 	<p>Prerequisite of basic arson investigator certification; <u>and</u></p> <p>4 years of fire protection experience <u>and either</u>:</p> <ul style="list-style-type: none"> • 6 semester hours of fire science or fire technology from an approved Fire Protection Degree Program; <u>or</u> • Acceptable combinations of coursework from either “A-List” or “B-List” courses; <u>or</u> • Acceptable combination of college courses with either “A-List” or “B-List” courses.
Advanced	<p>Prerequisite of intermediate fire investigator certification; <u>and</u></p> <p>8 years of fire protection experience <u>and either</u>:</p> <ul style="list-style-type: none"> • 6 semester hours of fire science or fire technology from an approved Fire Protection Degree Program; <u>or</u> • Acceptable combinations of coursework from either “A-List” or “B-List” courses; <u>or</u> • Acceptable combination of college courses with either “A-List” or “B-List” courses. 	<p>Prerequisite of intermediate arson investigator certification; <u>and</u></p> <p>8 years of fire protection experience <u>and either</u>:</p> <ul style="list-style-type: none"> • 6 semester hours of fire science or fire technology from an approved Fire Protection Degree Program; <u>or</u> • Acceptable combinations of coursework from either “A-List” or “B-List” courses; <u>or</u>

		<ul style="list-style-type: none"> • Acceptable combination of college courses with either “A-List” or “B-List” courses.
Master	Prerequisite of advanced fire investigator certification; <u>and</u> 12 years fire protection experience; <u>and</u> 60 college semester hours or an associate’s degree that includes at least 18 hours in fire science subjects.	Prerequisite of advanced arson investigator certification; <u>and</u> 12 years fire protection experience; <u>and</u> 60 college semester hours or an associate’s degree that includes at least 18 hours in fire science subjects.

A. Continuing Education Requirements

Texas fire and arson investigators are required to maintain their certification by participating in at least 20 hours of continuing education coursework from the “A-List” or “B-List”, or a combination of the two. Alternatively, if an individual has completed a TCFP-approved academy in the 12 months prior to his or her certification expiration date, a copy of that certificate of completion is documentation of continuing education for that certification renewal period.³ Arson investigators are also required to maintain their peace officer certification, which requires an additional 40 hours of continuing education coursework per training cycle (training cycles are two years long; the next cycle runs from September 1, 2011 to August 31, 2013.)⁴

B. NFPA 1033 Guidelines

In 2009, the NFPA released enhanced guidelines for education and

³ Information on fire investigator training and continuing education requirements was obtained from the most recent edition of the Texas Commission on Fire Protection’s *Standards Manual for Fire Protection Personnel*.

⁴ http://www.tcleose.state.tx.us/content/licensing_certifications.cfm

training of fire investigators nationwide, and clarified that the guidelines should apply to *all fire investigators*. Under NFPA 1033's guidelines, fire investigators should have, at a minimum, a high school degree plus successful coursework in the following topics at a "post-secondary education" level:

- fire science;
- fire chemistry;
- thermodynamics;
- thermometry;
- fire dynamics;
- explosion dynamics;
- computer fire modeling;
- fire investigation;
- fire analysis;
- fire investigation methodology;
- fire investigation technology;
- hazardous materials; and
- failure analysis and analytical tools. (NFPA 1033 at 1.3.8.)

Fire investigators must also maintain their knowledge in these subject areas and "remain current" with investigation methodology, fire protection technology, and code requirements by attending workshops and seminars and/or through professional publications and journals. (*Id.* at 1.3.7.)

The Commission recommends that the TCFP phase in a timeline for requiring all investigators to comply with NFPA 1033. The first phase should require that any fire investigator who testifies in court come into compliance with NFPA 1033 standards as soon as practicable. Subsequent phases should require compliance based on the levels of responsibility assumed by investigators. The timeline should be aggressive but flexible to encourage a smooth transition toward compliance. Continuing education requirements promulgated by the TCFP should incorporate NFPA 1033's guidelines.

The FSC also recommends that the SFMO expand its mock trial program to include more participants. One alternative would be to allow for online participation, or to work with the TCFP to make the program a component of continuing education for arson investigators.

RECOMMENDATION 4: COLLABORATIVE TRAINING ON INCENDIARY INDICATORS

The FSC is encouraged by recent efforts among fire scientists,⁵ investigators and officials at the SFMO to develop a training course that includes hands-on analysis of incendiary indicators through live burn exercises. The SFMO and TCFP should work with local fire departments to encourage maximum participation, possibly by offering sessions in multiple regional locations. A special effort should be made to ensure participation by smaller rural communities. The SFMO and TCFP should also take into consideration any other pertinent curriculum recommended by the NIJ and other national agencies and working groups. The FSC recommends that the following subjects be reviewed at a minimum:

- fire science basics;
- fuels;
- ignition;
- fire growth;
- incendiary indicators;
- myths and misconceptions;
- elimination of accidental causes;
- proper documentation and photos;
- eyewitness interviews;
- diagrams and use of the Ignition Matrix.

⁵ The FSC is especially grateful to Dr. John DeHaan for working with Commission staff to develop a suggested training curriculum.

Training should be limited to active fire investigators currently serving in Texas to encourage an open and honest exchange (similar to the “post-mortem” sessions conducted by medical doctors and scientists). It should include opportunities for investigators to participate in live burn exercises. All attendees should be given current copies of NFPA 921 and *Kirk’s Fire Investigation* at a minimum. Participants should receive continuing education credit for their attendance. Finally, an examination should be given at the end of the course to determine whether attendees absorbed key principles.

RECOMMENDATION 5: TOOLS FOR ANALYZING IGNITION SOURCES

New tools exist to help investigators identify and analyze various sources of ignition during a fire investigation. For example, the Ignition Matrix (*See Exhibit 32*) was introduced in the latest edition of *Kirk’s Fire Investigation* and NFPA 921 as a straightforward method for ensuring compliance with the various requirements of NFPA 921.⁶ The matrix prompts investigators to ask a series of questions regarding potential ignition sources. Investigators then label the information they have gathered based on pre-established color and notation categories. The approach constitutes a best practice method for evaluating sources of data at the scene of a fire and documenting the facts relied upon when reaching conclusions about various ignition possibilities. When carried out with a comprehensive map of the suspected area of origin, the Ignition Matrix provides investigators with a concrete way to conduct a methodical review of data and facts before forming an opinion, in compliance with NFPA 921. The SFMO

⁶ Information regarding the Ignition Matrix, developed by Lou Bilancia, was provided to the FSC by Dr. John DeHaan in February 2011.

should consider methods for integrating the Ignition Matrix into its training and investigative work.

RECOMMENDATION 6: PERIODIC CURRICULUM REVIEW

The FSC recommends that stakeholders (including representatives from the TCFP, SFMO, fire investigators and scientists) form a regular working group to review training curricula and ensure that it meets the ongoing needs of fire investigators in Texas. The group could also identify ways to take advantage of Internet-based training such as CFITrainer and virtual reality fire investigation programs. Because CFITrainer provides a variety of online options for achieving compliance with NFPA 1033, use of the website may be particularly helpful in rolling out the enhanced certification requirements discussed above.

RECOMMENDATION 7: INVOLVEMENT OF SFMO IN LOCAL INVESTIGATIONS

Local fire departments call the SFMO for assistance when they believe a case is significant enough to warrant such assistance. If the SFMO has personnel available, it sends them to assist. Based on discussions with SFMO leadership, it appears that the SFMO is always available to assist when called upon; the agency rarely (if ever) denies assistance. Some Commissioners have questioned whether there should be clear legal requirements governing cases in which the SFMO appears for assistance. The Commission strongly recommends that the SFMO have an Advanced or Master Arson Investigator participate in all fire investigations involving the loss of life.

RECOMMENDATION 8: ESTABLISHMENT OF PEER REVIEW GROUP/MULTIDISCIPLINARY TEAM

The Commission strongly recommends that the SFMO establish a peer review team (perhaps to include someone from the SFMO, a local investigator, a fire scientist and a medical examiner) to review pending and completed arson cases on a quarterly basis (similar to the cold case DNA task force group, or CPS' review of child abuse cases, multidisciplinary team (MDT) models, etc.) This would be a good-faith effort to assure the public that there is a review mechanism in place, especially for structure arson cases involving fatalities. It would also be a way to encourage ongoing professional development across the field. The most efficient approach may be to establish regional MDTs.

RECOMMENDATION 9: STANDARDS FOR TESTIMONY IN ARSON CASES

The FSC recommends that the SFMO and local fire investigators begin implementing the standards set forth in NFPA 1033 and related guidelines to improve the overall quality of testimony offered in arson investigations.

RECOMMENDATION 10: ENHANCED ADMISSIBILITY HEARINGS IN ARSON CASES

The FSC recommends that admissibility hearings (also referred to as *Daubert/Kelly* hearings) be conducted in all arson cases, due to the inherently complex nature of fire science and the continuously evolving nature of fire investigation standards. The FSC encourages both prosecutors and defense counsel to aggressively pursue admissibility hearings in arson cases. In addition, judges should affirmatively exercise their discretion to hold such hearings in all

arson cases as a method of ensuring that fire science testimony is reliable and relevant.

RECOMMENDATION 11: EVALUATING COURTROOM TESTIMONY

The Commission recommends that the SFMO and local fire departments develop policies and procedures for the evaluation of courtroom testimony.

RECOMMENDATION 12: MINIMUM REPORT STANDARDS

SFMO leadership reviews each fire investigation report submitted by its investigators, and instructs investigators to revise their reports if there is any indication of an incomplete analysis. This process is designed to help ensure that the scientific method is followed by SFMO investigators. However, it is limited to fire reports submitted by investigators employed by the SFMO; there is no standardized reporting method that applies to fire investigators statewide.

The Commission recommends that the SFMO develop and release minimum standards for fire investigation reporting statewide. As the NAS Report notes, “there is a critical need in most fields of forensic science to raise the standards for reporting and testifying about the results of investigations.” (NAS Report at 185.) Minimum standards should verify that key elements have been reviewed, documented, collected, photographed (to the extent applicable) and analyzed. They should also have a method for red-flagging scenarios in which additional consultation might be necessary (such as when an electrical engineer should be called in to help with arc mapping, etc.). They should track key elements of NFPA 921, and evolve as new editions are released. Tools such as the Ignition Matrix and voice-recognition software should be integrated into the

report-writing process. The SFMO has obtained a grant for the use of voice-recognition software; the FSC encourages the agency to seek additional ways to expand opportunities for using the software.

RECOMMENDATION 13: PRESERVATION OF DOCUMENTATION

The Commission notes that review of documentation in the Willingham case presented difficulties because the documents, photographs of fire debris and related records were no longer available. Local fire departments and the SFMO should preserve originals and forward only copies of documentation.

RECOMMENDATION 14: DISSEMINATION OF INFORMATION REGARDING SCIENTIFIC ADVANCEMENTS

The SFMO should identify additional ways to help the fire investigation community in Texas stay current with national developments in fire science. For example, there should be a consistent and effective method for disseminating new information regarding the results of fire science experiments and controlled burn studies. Formats could include quarterly electronic newsletters, regular online forums, periodic webcast updates, NIST and NCJRS library resources, journal abstracting services, etc. The SFMO may also consider retaining a fire scientist to consult on an as-needed basis. Such a relationship would encourage the free flow of information between the two communities and provide a continuous source of outside expertise for particularly challenging interpretive questions.

The FSC recommends that the SFMO perform an internal audit to evaluate fire investigation training, certification, policies and procedures to ensure compliance with all relevant national standards. The FSC recommends that the

SFMO develop a plan for implementing new standards as they evolve as well as ongoing quality assurance measures.

RECOMMENDATION 15: CODE OF CONDUCT/ETHICS

State agencies and professional organizations often have a Code of Conduct or Ethics to guide expectations. The FSC understands that the SFMO does not currently have such a Code; the FSC recommends that the SFMO establish a Code of Conduct/Ethics for fire investigators in Texas.

RECOMMENDATION 16: TRAINING FOR LAWYERS/JUDGES

The FSC recommends that the Texas Legislature and/or any other body overseeing continuing education in Texas consider requiring judges and lawyers practicing in criminal courts to have some form of ongoing forensic science training as a component of their Continuing Legal Education obligations.

RECOMMENDATION 17: FUNDING

The Commission urges that the Texas Legislature and municipalities take steps to ensure that sufficient funding is available to provide training to fire and arson investigators so that they may meet the standards set out in NFPA 921 and NFPA 1033, and stay current with national advances in fire science.

The FSC further recommends that the Texas Department of Insurance make it a priority to ensure that the SFMO receives sufficient funding so that its fire and arson investigators are properly trained to meet the standards set out in NFPA 921 and NFPA 1033, and so that they are able to stay current with advances in fire science.

Finally, the FSC recommends that the SFMO aggressively seek out alternative sources of funding for education of its investigators, including but not limited to federal and private grants.