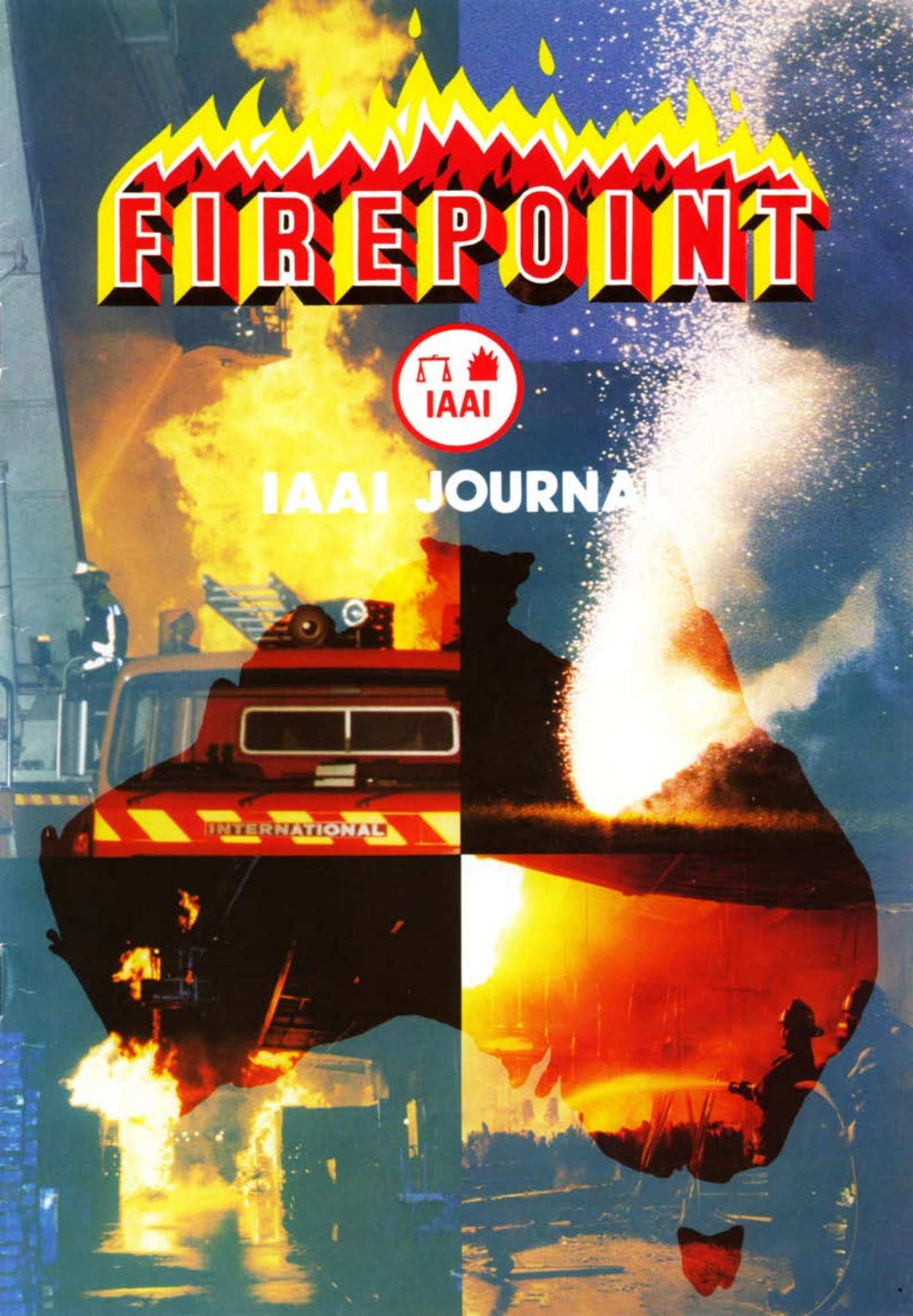
FIREPOINT

IAAI

IAAI JOURNA



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Firepoint

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EDITORIAL

Case Studies were nominated in a survey of members, as an area of special interest. In this issue, four case studies are presented, two from the U.S., and two from Australia. I would like to include at least one Case Study in each issue. You can help. Regardless if you are a lawyer, adjuster, assessor, claims manager, factual or scientific investigator, police or fire brigade employee, you must have at least one story to tell. Let's hear from you. This is your journal, and requires your input.

The two local Case Studies both involve spontaneous combustion. Or do they? Like electrical causes, spontaneous combustion can be an easy out, if a cause is difficult to spot. I welcome any comments, constructive criticism or advice, on the cases discussed. We can all learn from a healthy debate of relevant issues.

This issue also contains an article on NFPA 921 (1995), which is causing a deal of controversy in the U.S. A second article on this topic will appear in the next issue. There will also be included a letter recently received commenting on the ethics paper of Paul Bahr. I'd love to hear from more of you.

There are inserts included with this issue of important meetings in the months ahead. They represent important learning opportunities for all our members. Your committees urge as many as possible of you to take these opportunities to learn more about fire investigation and to network with your colleagues.

Wal Stern

CONTENTS

(Vol. 7, No. 2, June, 1996)

NEW SOUTH WALES NEWS

NSW PRESIDENT'S REPORT

(From the desk of President Roger Bucholtz)

Welcome to another edition of "Firepoint", OUR magazine for the members of IAAI and AFI.

I emphasise OURS as this was the purpose of launching into production of the magazine, to inform and educate all members of our organization. Initially designed to service only NSW members, it has now expanded nationally, leading to a greater amount of cross sharing of information between each state. This benefits those involved in the industry by broadening not only knowledge but also the network of contacts in numerous disciplines associated with our work.

The date of our Annual General Meeting has been changed to coincide with the Annual Conference. One of the benefits of this change is to allow the incoming committee sufficient time to prepare for the next conference. Also, a majority of our members attend the Annual Conference, and it will allow them to attend the AGM. In formation regarding the 96 Conference is given in the flier you receive with this issue.

The conference features three outstanding overseas speakers, James Munday from the Metropolitan Police Forensic laboratories, London, William Davis from the Montgomery Fire Department, Alabama, USA, and from distant Tasmania, Colin Thomas, from the Tasmanian Police Academy. There are also outstanding local experts.

I would also like to encourage any member who has either any criticism, comment or suggestion regarding content or information published in "Firepoint" to write to the Editor (address given on page 3). Healthy debate is always worthwhile.

Photographic Competition.

In conjunction with the seminar to be held in July, 1996, the NSW AFI proposes to have a photographic competition.

Entries are invited from one and all. There are two categories:

- Deliberate fires
- Accidental fires
-

Please submit entries to: Robert Cameron, Secretary, NSW Association of Fire Investigators, c/- Abbott Tout Solicitors, Level 42, MLC Centre, 19-29 Martin Place Sydney, NSW, 2000.

NEW SOUTH WALES

ASSOCIATION OF FIRE

INVESTIGATORS

1996 CONFERENCE

STAMFORD HOTEL, NORTH RYDE, SYDNEY

25 AND 26 JULY, 1996

FIU REPORT

(Compiled by Alan Easy, Head of the NSW Fire Brigade Fire Investigation Unit).

Fire is indiscriminate, as evidenced by the Fire Investigation Unit investigations these last three months. Of the 150 fires attended, there were two churches, a nursing centre, five schools, a cabin cruiser, a service station, a hotel, a pram shop, a police station, a brothel and three deaths. All that was needed was a solicitor's office, to round off the full cycle of life.

The Coronial Inquiry into the Bowlers Club of NSW fire commenced at the Glebe Court. What was planned to be completed in one day has now had another four days allocated in July. Legal representation for several groups associated with the building have been given leave to appear by Coroner John Abernethy.

The multi-million dollar high rise building fire occurred on the afternoon of 20th September, 1994, whilst the club and offices were occupied. Ten persons were injured in the fire, some being rescued in dramatic circumstances.

The inquiry, in opening, quickly focussed on the function and performance of the installed evacuation system, the automatic fire alarm panel, air handling and the fire dampers.

It is evident that this fire will be a lesson to us all, in illustrating that the investigator is expected to investigate and consider a wide range of matters, other than just cause, all of which may have impacted upon the progression of fire.

Certainly for FIU with its fire safety role, we take into account the performance of automatic fire alarms and suppression systems, air handling, fire walls, emergency lighting, egress and so on.

Insurance assessors and others should appreciate that access may be denied into fire scenes until such time as the fire cause investigation is complete. If the fire is clearly suspicious then the fire scene is a crime scene and as such is out of bounds. The Bowlers Club fire scene was deluged with persons wanting access.

In two supermarket fires, the causes have been traced to the evaporative units of a particular brand of commercial refrigerator. As is the procedure on faulty electrical appliances the matter was referred to the NSW Department of Energy, the state government department which is responsible for electrical safety of appliances and other electrical articles. A recall is now being considered.

VICTORIAN NEWS

VICTORIAN PRESIDENT'S REPORT

(A note from Adrian Edwards)

Negotiations are still in progress but the dates have been set for our two day seminar, to be held 2nd-3rd October at Chaucer's in Canterbury.

On Wednesday, 23rd April, Terry McCabe, Jeff Sear and myself ventured to Hobart for a presentation. Although the response to the presentation was not as pleasing, the response to membership has been very promising. This has extended the Victorian Chapter into Tasmania with a further increase in membership for our Chapter. Our thanks to Colin Thomas for his assistance, and a special welcome to our new members.

Membership
The committee welcomes the following new members to the Victorian Chapter:

Peter ENDLER
David JOHNSTON
Kristina WILMS
Leigh LOVEGROVE
Allen CORNISH
David ORPWOOD
Bruce KAYLER_THOMSON
Kenneth THOMAS
Allan RANKIN
Alan CONN
Lindsay GUY
Gregory THOMAS
Ian MARSHALL
Shane GRATTIDGE
Mark SMITH
Colin THOMAS
Barry JARVIS
Stephen WALKLEY

This brings our membership to 167 financial members. All members please be aware that membership fees are due as from 1st July, 1996, for the year 96/97 and that they have been increased to $30. To be eligible to vote at the AGM you need to be financial.

Committee News
Following the listing of the members of the Committee in the last issue there has been one further change. As you were aware Tony McIntosh retired and his replacement was to be Dennis Trafford from ICA. Unfortunately (for us) Dennis has been promoted and his replacement is Bob Mitchelson. Welcome, Bob to the committee in your first week at ICA.

The visit by Adrian Edwards and Terry McCabe to Hobart was successful to enhance our membership and to provide a forum in Tasmania for those interested in Arson and Fire Investigation. The presentation on Forensic Photography (see details below) was not so well attended. Our thanks to Jeff Sear. Tasmanian members should direct any enquiries through Colin Thomas (0419 55 2280) or Terry McCabe (03 9616 9594), your committee representative or to the Secretary.

Photographic Night
A dinner meeting was held on Tuesday, 26th March, at Bell's Hotel, South Melbourne. The theme was Photography and the Fire Scene - Improving your Techniques, presented by Sergeant Trevor Blake, Photographic Section, Victoria Forensic Science Centre. From those 40 members who attended, a thank you to Trevor.

1996 Program of Events
Although precise dates and times are unavailable at time of printing the list of events below are presented for your information and planning:

EARLY JUNE
Breakfast Meeting
COMPUTER CRIME
Venue - TBA

EARLY JULY
Annual General Meeting
Venue - Bell's Hotel
South Melbourne

LATE AUGUST
"House Fire"
Country Presentation
Shepparton

2/3 OCTOBER
CHAPTER TWO DAY SEMINAR AND DINNER
CHAUCER'S, CANTERBURY
Refer inset brochure

NOVEMBER
CHAPTER GOLF DAY
Venue - TBA

QUEENSLAND NEWS

QUEENSLAND PRESIDENT'S REPORT

(Queensland President Terry Casey reports on an important meeting of the equipment Safety Working Group , of the Electrical Regulatory Authorities Co-ordinating Committee (ERACC), which was held on March 21, 1966).

SPECIAL MEETING ON APPLIANCE / EQUIPMENT FIRES.

This Meeting included representation from:

Various State Energy Regulators;
Electrical Goods Manufacturers;
CESA - the Electrical Goods Importers Association;
AEEMA - the Australian Electrical Goods Manufacturers Association;
Standards Association of Australia;
Queensland Association of Fire Investigators.

As the meeting was a special meeting, it was allowed to flow relatively freely, highlighting limitations of the way in which electrical fires are dealt with in the various states and New Zealand.

Cooperation between parties.

The Chairman invited each Regulator and/or Fire Service to comment on the procedures adopted in their State to Investigate appliance fires.

It was indicated that in Queensland, South Australia and New Zealand, a very close liaison had been established between the Regulator and the Fire Service. Systems had been established for the Fire Service to obtain the on site assistance of the Regulator at specific fires suspected to have been caused by an electrical appliance. These systems also had enabled the Regulator to examine appliances that might have been otherwise lost to an examination.

It was indicated that in both New South Wales and Victoria no formal system existed and that cooperation was achieved on an ad-hoc basis. In NSW appliances were brought to the Regulator for examination as circumstances required.

Industry commented that it was important for importers and manufacturers to be made aware of incidents as soon as possible and to be given the opportunity to examine failed appliances. The Regulators indicated that this was already done.

Reporting System.

It was indicated that all Fire Services utilise the Australian Incident Reporting System (AIRS) and that the information is correlated and reported by the CSIRO annually.

The incident reports are completed by the Officer at the fire scene and details recorded include the Brand and Model of any equipment thought to have been involved in the incident. The Queensland Service indicated that their officers were strongly encouraged to complete these entries.

Each state Fire Service can interrogate and report on their own data but it. was reported that this data was not routinely forwarded to Regulators.

The meeting, while recognizing that AIRS was satisfactory for Fire Service purposes for which it was designed, noted that the appliance/equipment categories did not exactly meet the needs of the Regulators or Industry. It was considered that some categories were too broad or did not exist. It was also noted that the reports did not necessarily make a distinction between a fire caused by an appliance or a fire involving an appliance. In addition there appeared to be no clear distinction between a fire and an incident.

It was also suggested that many fires would not be reported to a Fire Service but would be the subject of an insurance claim.

Appliances of Particular Concern.

Television Receivers

The meeting noted that there had been 86 TV fires reported for the period 1994-95 (NSW-31, VIC-29 , QLD-18, SA-8)

Industry representatives suggested that a number of brands were not manufactured to the current standard. They were of the opinion that all televisions should be required to comply with Standard. Particular concern was raised with receivers with a standby function as a number of fires had involved that type.

Comment was made that the age of the units (i.e. whether or not of contemporary design) could be a factor, however no age details were available. It was suggested that age was immaterial because today's models would age and should be safe. The current fire tests (or any other appliance fire tests) however do not address the effects of aging.

It was reported that in response to concerns Australian/New Zealand Standard 3250 had been recently amended to increase the fire prevention requirements and that these requirements now reflected world best practice for the product type. The standard previously exempted television receivers from some of the fire tests.

It was suggested that computer monitors should be included in discussions but statistics showed that very few monitor incidents were known and that those that had occurred recently were confined to a particular brand and model.

Further, it was stated that monitors are usually manufactured to a higher costing and do not exhibit the failings of TV receivers.

Clothes Dryers.

There was general concern with fires caused by lint build-up inside the dryer body and with users not following filter cleaning instructions.

Industry indicated that despite comprehensive instructions filters were not being cleaned but suggested that education was the only real preventative means.

With regard to lint build-up no preventative means was immediately evident due to the various designs used to circulate air.

Dishwashers.

Two fire causes were identified relating to the door wiring loom. One concerned the fracture failure (and arcing) of the loom conductors where they flexed at the entry to the door and the other concerned the degradation of loom insulation by leaking detergents and the like inside the door.

The meeting noted the "Dishwasher Fires European Study" and "Fires in Dishwashers Summary and Recommendations" reports sponsored by the Consumer Safety Unit of the Department of Trade and Industry (UK).

The meeting was also advised that a proposal to go to IEC had been prepared by New Zealand to require wiring looms to undergo specific fire tests.

Jug/Kettle.

Three concerns were noted-

a) Water spillage onto the contacts of cordless kettles. The meeting was advised that this problem would be addressed when Australia/New Zealand adopts the International Standard (ISC 335-2-15). The standard is to go to public review/committee ballot in April/May 1996 and if accepted be published before the end of the year;

b) Tracking over insulation in the steam path; and

c) Incompatibility of some plug and socket combinations where the plug contacts were of the box or tubular construction. It had been found that a loss of contact pressure had caused overheating and resulted in melting of the plug body.

Cooking Ranges/ Hotplates.

The meeting expressed some concern at the number of fires related to both types but because of a lack of a clear distinction between cooking and equipment (particularly bench charring) fires, in fire reports, no specific comment was possible. The meeting noted that the relevant Australian/New Zealand Standard 3172 is to be the subject of review in the process of adopting the International Standard. The International Standard applies different test methods (e.g. lids on the cooking vessel) to that required by the current standard and results in lower test temperatures.

Information Sharing.

A general discussion was undertaken with respect to the sharing of information available. During this discussion the following additional features were of significance:

1. The Federal Bureau of Consumer Affairs must, by law, be notified of all recalls, both forced and voluntary. This material was considered to be publicly available, and hence the process of notification of insurance companies once such recalls become public was raised.

2. No mechanism appeared to exist which would lead to the notification of the Bureau of Consumer Affairs of overseas recalls, even though such products may be available locally.

3. While many of the bodies represented at the meeting had been aware of a small number of fires which related to a particular brand of fans, the extent of the problem was not realised for some time. Had that information been shared and the extent of the problem realised earlier, then the products would have been withdrawn much earlier, saving lives and substantial material damage.

4. The NSW Fire Services had in place an extensive data base, access to which was available by the public, although the level of detail available to the public was unclear.

5. Information was shared amongst the group about the occurrence of dishwasher fires, and a UK based paper on such fires was provided. While many of the bodies represented were aware of such fires, it was concerning that a representative of the Standards Association Technical Committee could state that no dishwasher fires had been reported to their technical committee in the past eight years.

6. Case histories were quoted to highlight that local agents of some electrical goods ignored, or deliberately submerged evidence of substantial electrical faults which had led to fires. Such a comment drew a response from the CESA (Electrical Importers Association) representative, indicating that they would be pleased for such cases to be exposed, thereby eliminating such unethical behaviour to the benefit of the majority of their members.

7. The various manufacturers of electrical goods were strong in their wish to be notified earlier of appliance fires such that they could contribute their considerable expertise in determining the cause of such fires. Defects in electrical goods, if identified early, could be rectified quickly. They had no wish to have their reputations tarnished, or to face extended law suits over the continued circulation of any defective product.

Regulation.

It became obvious during the meeting that there were a number of specific agendas which were just below the surface of the meeting. The issue of government regulation, particularly the list of prescribed electrical items, was contentious. Significant points in this regard were as follows:

1. It was almost a foregone conclusion that government involvement in regulation of the electrical industry would decline and decline substantially ,

2. There was strong pressure to decrease the number of prescribed items, moving in

favour of industry self-regulation;

3. The pressure for such deregulation appeared to come from high government levels, and in a response to a policy of reducing government spending .

4. The CESA representative was not in favour of reduced government regulation, as it was one of the few mechanisms which provided a 'a level playing field' for quality goods manufacturers and/or importers, to compete with the poorer quality, less responsible manufacturers/ importers.

5. Only prescribed items were required to meet relevant Australian Standards, non prescribed items, including the majority of what could be described as electronic equipment, were not regulated other than in NSW where catch-all 'goods must be safe' legislation exists.

Determining the cause of electrical fires.

During this discussion the following points were made:

1. Manufacturers, while they were keen to assist in the determination of the cause of fire indicated that they rarely heard of fire losses until months or years later, when litigation had been initiated;

2. The involvement of fire services and police scientific occurred at a stage when major fires had developed, and hence, while the cause of the fire may be allocated to a particular appliance, the extent of the damage was such that the cause of the fire within the appliance was seldom identified. Little, if any, information is available in such fires to assist manufacturers in rectifying or identifying problems.

3. It came as a surprise, though a welcome one, for the meeting to realise that they had previously overlooked the fact that small fires, hence ones where the cause of an appliance fire may be determined, are only seen by the insurance industry.

4. The involvement of the insurance industry in identifying types and models of appliances causing fires could be critical to reducing the incidences of such fires.

Recommendations.

1. That each Regulator, where not already done, seek from their respective Fire Service, on a regular basis, up to date information on appliance caused fires and that relevant information be passed to the appropriate manufacturer or importer.

2. That each Regulator, where not already done, develop with their respective Fire Service a procedure to allow the Regulator, on a regular basis, to examine fire damaged appliances and particularly those appliances where the cause of the fire might be determined.

3. That consideration be given to creating a central register of appliance fires such that brand and mode identification are recorded.

4. That a meeting be arranged by ERACC with the Australian Assembly of Fire Authorities, The Insurance Council of Australia and Industry associations to discuss the possibility of amending the Australian Incident Reporting System to better record and report information of benefit to Standards, Regulators and Industry.

5. That ERACC add television receivers to the declared article list.

XXXXXXXXXXXXXXXXXX

Fifth International Symposium on Fire safety Science.

Papers and posters are now being called for the above conference, to be held in Melbourne, 3-7 march, 1997. For further information contact Waldron Smith Management, 93 Victoria Avenue, Albert Park, Victoria, 3207.

XXXXXXXXXXXXXXXXXX

An Engineered Approach to Fire Safety

by W S (Steve) Coombe

A summary of a talk given by the author, from Lincolne Scott, to AFI (NSW) in March, 1996, prepared by the author.

The Building Code of Australia (BCA) has specified the prescriptive requirements for building design and construction of all buildings. This code refers to various Australian Standards which specify detailed design and installation requirements for fire safety systems. These standards detail precise requirements and installation criteria which have to be implemented. This results in buildings of similar size, occupancy and configuration being provided with the same standard fire safety features. These fire safety requirements relate to the actual building only. The prescriptive requirements define the building safety systems for a particular building. It does not require any emergency planning or evacuation procedures, which are an important part of the overall safety systems required for the protection of life and property.

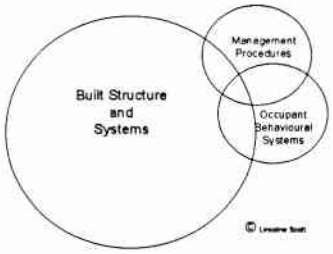
In the event of a major fire the fire investigator should have an understanding of what systems were installed within the premises which may assist in the investigation.

The Past

Generally safety was assumed if Building Regulations were complied with.

Property safety involved organisational culture and procedures.

Building Regulations
The Safety Net



Presently Focus on Built Structure and Systems

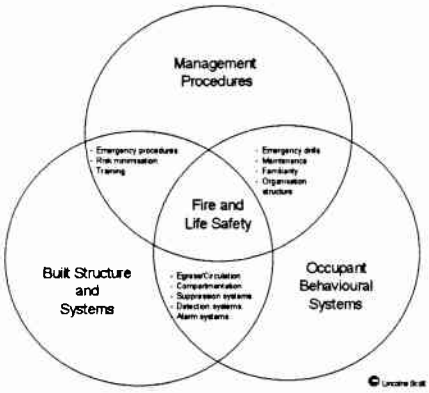
The Future

Building Regulations will provide a "Safety Net" - but a vastly different one.

The future of building design and construction in the future will lead to performance based design and building criteria. Whilst this will allow flexibility for the designer or owner it will not provide the fire investigator with the same basic knowledge after a fire. The will require the whole building (including occupants) to be "safe" from the effects of a fire within the building.

The performance based designs will take into account all fire safety facilities within the building and are likely to be based on computerised fire modeling.

Building Fire and Life Safety Components



What are the Technologies for each section?

Whilst the Building Code of Australia and associated Australian Standards specified the requirements for building safety the move towards performance based codes which will require not only compliance with the Building Code but it will be necessary for building owners and employers to provide adequate management systems and evacuation and emergency procedures to ensure the safety of occupants and employees. As a part of the quality management process these will need to be documented and the level of performance achieved recorded by reviewing the evacuation and emergency plans for the particular building.

Consequently, the Fire Investigator will need to research each particular premises to determine fire safety features installed and the adequate performance of those systems in fire condition, in particular the management and emergency procedures.

CASE STUDY: Dishwasher Explosion Proves Perplexing

by Mike Blair, CFI

(Reprinted from the December 1995 issue of "Fire and Arson Investigator")

Explosions in the home are not considered a common occurrence, but when they do take place many times they're attributed to a gas leak. Most people would never expect their kitchen counter to blow up in their face moments after turning on the automatic dishwasher. On October 23, 1991, such an event did occur in a retirement resort located in Glendale, Arizona.

The three storey apartment building appeared new. The upper apartments had never been occupied. Before an apartment was leased it was inspected by the maintenance department to insure that all conveniences were in working order. The inspection included testing the dishwasher located in the lower kitchen cabinet, under the sink. The procedure involved moving the cycle indicator wheel through a complete cycle which allowed water to enter the machine that was then pumped out. Water taps were opened to purge air and/or accumulated corrosion or dirt out of the water lines.

Two employees were conducting the tests in the apartment. One employee was crouched in front of the dishwasher moving the cycle indicator wheel through its program while the other man opened the water taps. The first setting, which controlled water entry, was missed when the indicator wheel was rotated through a complete cycle in order to set the dial to its first position.

As he made proper contact with the first setting he could recall hearing water enter the unit along with "air."

That was his last recollection; in the next instant his body was propelled backwards by the force of the dishwasher door as it was catapulted off its hinges. The force lifted the entire counter and sink upward at the same time shattering and expelling adjoining cabinets. The employee was knocked unconscious when his head struck the cabinet behind him.

The second employee heard the water flow into the unit and also heard the sound of "air" bubbles. The explosion was almost immediate. Somewhat stunned by the impact he rushed into the kitchen to find his partner lying unconscious in a pool of blood. He quickly summoned help.

After treating the patient, firefighters requested the services of the department's fire investigators. Although no fire had occurred there was no explanation for the dishwasher to explode with such force.

Fire Investigator Robert Boston examined the scene and was unable to locate any evidence of intentional tampering or the presence of incendiary material. Although the machine was badly deformed by the explosion there were no signs of burning. The machine was clean and appeared new.

Investigator Boston determined that methane gas build-up in the drain system may have backed-up and collected in the dishwasher. The complex had experienced nauseous odors being emitted from some sections of the sewer system, but there was no obvious evidence to either prove or disprove this possibility.

Property management, fearing a reoccurrence, solicited an independent investigation into the cause of the explosion. Three investigators conducted an extensive investigation over a two day period that included the disassembly of the dishwasher as well as the electric water heater that supplied it.

As the compression nut on the water line leading to the dishwasher was being loosened, gas was heard escaping during the testing. The nub was immediately re-tightened. After some thought, the nut was again loosened. When the sound of escaping gas was heard, a lighted match was dropped towards the fitting. The gas ignited and produced a sustained burn. It became evident that the water line contained a flammable gas.

Further investigation revealed that the water heater that supplied the tank contained a sacrificial anode made of magnesium which was installed to retard the oxidation process of the system. During the corrosion process of the anode or heater, hydrogen gas was generated. The amount of gas produced was relatively small, and under normal use is expelled before dangerous levels can collect. In this instance, the extended lack of use of the system had allowed a large volume of gas to accumulate in the tank .

Effects of Class "A" Foams on Fire Debris Analysis.

The NSW Fire Brigades are currently introducing fire fighting vehicles that will be using Class "A" Firefighting Foams to extinguish fires in both bushland and also in structures.

The NSW Fire Brigade Fire Investigation Unit has expressed concern that the use of such foam may adversely affect the analysis of fire debris samples due to the nature of the ingredients of the foam compound, some of which allegedly contain hydrocarbons.

The FIU has reported that overseas research articles are inconclusive, as they do not always indicate the brand of foam tested or the exact effects on the analysis. It recommends that independent local studies be carried out on samples of the foam to be used, to determine the possibility of contamination of the fire debris.

The product to be used is FC-3150 3M Brand Fire Brake Bushfire Fighting Foam, manufactured by 3M Australia Pty Ltd.

Examination of the relevant literature, and of a sample of FC-3150, kindly supplied by Mr. Ted Schaeffer of 3M Australia Pty. Ltd., was carried out by Tony Cafe and Wal Stern, in the Geronimo Fire Investigation Laboratory, University of Technology, Sydney.

The claims made in the overseas literature are that:

- *the components of Class "A" foams may themselves be hydrocarbons, or ingredients of common accelerants*

Examination of the Material Safety Data Sheet for FC-3150, and chemical analysis of a sample of FC-3150 showed that it contained no hydrocarbons, or ingredients of common accelerants.

- *the components may chemically react or degrade ignitable liquids commonly used in accelerants*

Examination of the chemical nature of the components of FC-3150 showed that these components would not react with or degrade hydrocarbons or ingredients of common accelerants.

- *the components of Class "A" foams may be detected when examining fire debris samples for possible accelerants*

Chemical analysis by dynamic headspace and gas chromatography of a sample of FC-3150 showed that one component of the foam produced a large peak, which may be observed when analysing fire debris samples.

Its position in the chromatogram would easily allow it to be distinguished from petrol, kerosene and other common accelerants. It would not interfere with accelerants.

- *most chromatograms are normalized to the largest peak, and it may be necessary to enlarge the chromatogram, if a component of foam is present in significant amounts*

One component of FC-3150 may be detected when carrying out fire debris analysis, and could possibly give a large peak in the chromatogram but knowledge of its possible presence, and knowledge of where it might be found on a chromatogram, should allow its elimination as a fire debris accelerant component, and should not interfere with other accelerant analysis.

In summary, the introduction 0f FC-3150 Class "A" Firefighting Foam should not adversely affect the analysis of fire debris samples being analysed for the presence of accelerants, provided the analyst is aware of its possible presence, and its chromatographic characteristics.

Fire Investigation Standards Committee
NFPA 921 Bulletin Board

(Reprinted from the September 1995 issue of "Fire and Arson Investigator")

by Terry-Dawn Hewitt

A number of questions have been surfacing lately regarding a document produced by the NFPA Technical Committee on Fire Investigations, NFPA 921, "Guide for Fire and Explosion Investigations." The IAAI Fire Investigation Standards Committee has been formulated to assist the general membership of the IAAI to gain a better understanding of NFPA 921. Below are the answers to five questions that are frequently asked about NFPA 921:

1. What is NFPA 921?

This question is best answered by reference to the NFPA 921 document itself. The following excerpt from the introduction to NFPA 921 describes its origin and development:

"...(NFPA 921) was developed by the (Technical) Committee on Fire Investigations to assist in improving the fire investigation process and the quality of information on fires resulting from the investigative process. The guide is intended for use by both public sector employees who have statutory responsibility for fire investigation and private sector persons conducting investigations for insurance companies or civil litigation. Throughout the development of this document, it has been the goal of the committee to provide guidance that is based on accepted scientific principles or scientific research." [1]

The stated purpose of NFPA 921 is "to establish guidelines and a recommended practice for the safe and systematic investigation or analysis of fire and explosion incidents." [2]

The 1992 edition of NFPA 921 was the first edition. A number of changes to this edition were acted on by the National Fire Protection Association at its fall meeting in November, 1994 and a 1995 edition is now available.

2. Is NFPA 921 a Code or Standard?

NFPA is a "Guide." NFPA Technical Committees produce four different categories of documents: Codes, Standards, Recommended Practices and Guides. To understand the difference among these categories, it is useful to review NFPA's definitions of these terms.[3]

Standard - A Document, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements, which is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Non-mandatory provisions shall be located in an Appendix, footnote, or fine-print note and are not to be considered a part of the requirements of a Standard.

Code - A Standard which is an extensive compilation of provisions on a broad subject matter or which is suitable for adoption into law independently of other codes and standards.

Note: The decision whether to designate a Standard as a "Code " is based on such factors as the size and scope of the document, its intended use and form of adoption and whether it contains substantial enforcement and administrative provisions.

Recommended Practice - A Document similar in content and structure to a code or standard but containing only nonmandatory provisions using the word "should" to indicate recommendations in the body of the text.

Guide - A Document that is advisory or informative in nature containing only non-mandatory provisions. A Guide may contain mandatory statements such as when a Guide can be used; but, the

Document as a whole is not suitable for adoption into law. These definitions refer to "mandatory" or "nonmandatory" provisions, which are also defined:

Shall - Indicates a mandatory requirement.

Should - Indicates a recommendation or that which is advised but not required.

To conclude, NFPA 921 is not a code, not a standard, and not a recommended practice. It is a guide.

3. What is the position of the IAAI respecting NFPA 921?

The Board of the IAAI recognizes NFPA 921 (The Guide for Fire and Explosion Investigations) and NFPA 1033 (The Standard for Professional Qualifications for Fire Investigator) as guides to assist investigators in the field of fire and arson investigation.

The IAAI recognizes the guides can be used as a reference to assist the fire investigator in the field of fire and arson investigation.

Further the CFI committee, per previous Board approval, acknowledges and recognizes NFPA 921 and NFPA 1033 as reference material along with other recognized reference materials for purposes of our certification program of fire investigators within our industry.

4. Does The IAAI or its members have any say into the creation and ongoing development of NFPA 921?

Absolutely! First, the NFPA 921 Guide was created through the NFPA Standards Making System, designed to develop "consensus" standards, which are built on a foundation of maximum participation and substantial agreement by a broad variety of interests.[4]

NFPA 921 has been prepared through a process that provides public notice at a number of key steps in the process, through which public comment is invited and considered.[5] Interested IAAI members participated in the formulation of the latest edition of NFPA 921 by making submissions respecting changes and additions to the existing document. NFPA 921 is entering another active cycle, intended to produce another new edition by the end of 1997, which will come into effect in early 1998.

Second, of the thirty people on the NFPA Technical Committee on Fire Investigations who are responsible for the NFPA 921 project, a large majority are members of IAAI.

Third, the IAAI has an official representative on the Technical Committee on Fire Investigations. Mr. Joseph Toscano, CFI, of American Re-Insurance Company (CT) is the IAAI's current representative on the NFPA 921 project.

5. Where can a person obtain a copy of NFPA 921, 1995 edition?

NFPA 921, *Guide to Fire and Explosion Investigations,* 1995 edition (124 pp.) is available from NFPA for $26.50 (USD), or $23.75 (USD) for NFPA members.

NFPA *1033, Professional Qualifications for Fire Investigator,* 1994 edition is also available from NFPA, for $16.70 (USD), or $15.00 (USD) for NFPA members. Call toll-free 1-800-668-2955 to order.

End Notes

1. NFPA 921, p. 1 (1992 Edition).

2. NFPA 921, Chapter 1, para. 102 (1995 Edition).

3. NFPA Regulations Governing Committee Projects, sub-paragraph 203.6.1, "Definitions."

4. National Fire Protection Association, the *Standards-Making System.* (Quincy, MA: National Fire Protection Association, 1985.)

5. For more information on the NFPA Standards-Making System, contact the NFPA, One Batterymarch Park, Quincy, MA 02269-9101 USA, Telephone (617) 770-3000, Fax (617) 770-0700.

(Editor's Note: NFPA 921 (1995) can be purchased locally; call AFPA on 03 9882 2800. The cost to members is $A47.16.)

CAUSE OF FIRE IN A PARKED MOTOR VEHICLE?

by Adrian Wakenshaw.

(Adrian is a Fire Officer with the Country Fire Authority, Region 8, Dandenong, Victoria)

On Wednesday, 3rd April, 1996, Country Fire Authority units responding to a report of a car fire arrived on scene at 1546 hrs to a fire that had been extinguished in the front of a Holden Gemini four door sedan. The fire was put out by passers-by with buckets of water after the car was unlocked by the owner.

The car was parked in the open in a semi fenced area at the rear of the owner's place of work in a strip shopping centre. This area was open to access by passers-by and access was gained from a car parking area that went the length of the strip of shops and businesses.

The female owner of the motor vehicle was in some distress at the time of the brigade's arrival but the fire damage had been restricted to the front driver's bucket seat. Smoke and heat damage was evident to the interior of the car but mainly discolouration rather than melting of components. The fire had been discovered early in its development by the employer of the owner of the car when smoke was seen coming from the vehicle.

It was observed that the owner had removed the contents of the glove compartment and the boot. A burnt piece of rug was located near the front of the vehicle.

The owner advised us that the number plates had been stolen from the car on a previous occassion at this location, as well as other interference with the car. She also advised us that the passenger side front window was not fully wound up, leaving a gap of approximately 2 cm, to allow the heat of the day in the car to dissipate. Police were called to attend for possible suspicious circumstances, as no cause was evident that could have originated from the vehicle's systems. The owner was a smoker, on occassions, but would not normally smoke in her vehicle; the condition of the ash tray supported this.

The burnt area was confined to the seat cushion of the driver's seat, with a little charring starting to occur to the cloth upholstery of the back rest of the seat, a small inverted V pattern evident. The burning had been in depth to the seat forming a dish shaped hollow that had broken through the bottom of the seat itself.

Initially it was investigated if something had been put through the passenger side window but nothing to support this was found on the passenger front seat, the window or in the holdall that was part of the front door. It was surprising that there was really no burn mark on the inside of the driver's door given its proximity to the point of origin, only some discolouration consistent with the rest of the interior. Whilst there was significant charring evident to the seat and indeed destruction had occurred to parts of the seat and rug, it was suspected that little flaming combusion had taken place and that the majority of damage was through smouldering combustion.

The explanation by the car owner for the burnt rug near the front of the car was that it was used as a form of cushioning for the driver's seat. The rug was labelled "ALL COTTON" and was a noticeably coarse weave.

The electrical components of the car were intact and the owner was asked about use of the car that day. After arriving that morning at work she had only been out to the car at approximately 1330 hrs to spray insect spray inside the car to exterminate potential insects. It was further revealed that two types of spray had been used in copious quantities, including wihin the folds of the rug on the front seat. The spray cans used were obtained and one type was suitable for surface crawling instuments.

It was then decided to obtain confirmation of the now suspected self heating situation.

Upon referral to the CFA's Fire Investigation Scientist, Mr. Neil Barnes, confirmation was obtained that the properties of some household insect sprays with a surface spray use for crawling instruments have an oil carrier for the insecticide, these oils often being of the type conducive to oxidation that will generate heat and subsequently, initiate combustion given the right circumstances.

This type of reaction is dependent on the appropriate type of oil, a readily combustible material to which the oil has come in contact, and a ready supply of oxygen.

The subsequent rate of reaction will then vary with the temperature level of the surroundings. The progress of the reaction to the point of smouldering combustion is dependent on the mass of the materials involved producing more heat than can be lost to the surroundings. It can be seen then that insulation is a critical factor for combustion to take place.

Without going further into the science of self heating, readers are referred to the article by John De Haan in "Fire and Arson Investigator" (pp13-17, March, 1996) on "Spontaneous Ignition Part 1: What Really Happens".

Tables listing products susceptible to such reactions can be found in the NFPA Fire Protection Handbook, Chapter 5.

In conclusion, it was the restricted area of the burn damage that allowed the relatively quick adoption of self heating as the cause, this along with the information available at the scene as to the events that had transpired. It is readily acknowledged that severe damage to the car or other changed factors surrounding the event could have given a number of different options in a suspected cause.

SPONTANEOUS COMBUSTION OR SPONTANEOUS COINCIDENCE?

by Bill Krantzke.

(Bill is a former member of the NSW Police Force, having served 6 years with the Crime Scene Unit investigating fires on a regular basis. He currently runs his own business, KEY INVESTIGATIONS, from Port Macquarie on the NSW Mid North Coast carrying out Loss Adjusting and Insurance investigations).

I have been a member of the Port Macquarie Volunteer Fire Fighters for a short time and wish to pass on to readers of "Firepoint" a series of fire call incidents which would appear to be a re-occurring case of spontaneous combustion.

On six occassions between September and December, 1995, the Brigade was called to a section of the Oxley Highway approximately 4 kilometres from town. This section of the highway which runs basically North to South is divided by a sparsely vegetated and mulched covered, concrete boarded medium strip which is nearly a kilometre long. The 000 calls from various sources all related to the mulch being alight and smoke covering the highway, causing a traffic hazard to vehicles.

To the average person it could be assumed that this problem was a coincidence or perhaps just another case of careless cigarettes thrown out of a passing vehicle. I had a problem with this as all the fires with the exception of one occurred in a twenty metre section of the medium strip, the other fire occurring in a roundabout at the end of the medium strip which was constructed of the same materials. I attended the majority of the calls and there was always a section of bark burning freely upon arrival. On the second occassion after the fire was extinguished I made a closer examination of the freshly burnt area.

The mulch and bark which covered the dirt to a depth of 100 mm was well compressed between the sections of concrete border on the medium strip and at roadlevel showed no real signs of excessive temperature. Where the bark met the soil I saw the temperature had greatly increased and even after the fire had been extinguished I saw excessive heat and smoke was being produced from this composting area after every occassion.

Other factors worth mentioning are the temperatures on all occassions were between 28 and 31^0C, the humidity was always high, the air was very still with a very light or no wind blowing, and the time of calls were between 1 and 3 pm, which is generally a hot time of the day.

I made a number of inquiries with the RTA, who constructed the section of road and median strip nearly twelve months earlier. I was informed local top soils were graded in the area below the median strip and cuttings from local trees were mulched and used as fill in the area between the "medium".

The local soils used appear to have had a medium content of clay and iron in them and display a redish colour. The tree mulch used was a combination of gum, eucalyptus and small shrubs which were cleared as the road was constructed. The only other fact worth considering may be the road bitumen which could have made its way in to the medium section during the highway construction.

Although there was minimal damage to property I am wondering if any other readers have come across a similar situation where mulch ground cover has caught fire in similar circumstances.

CASE STUDY: An Ice Storm, the Gas Meter, and Electricity.

by A. K. Rosenhan, PE, SFPE (from the September, 1995 issue of "Fire and Arson Investigator")

A midwinter ice storm wreaked havoc in Mississippi during February 1994. The electric power distribution system was virtually destroyed throughout a large portion of the state. Trees, power poles and other structures simply collapsed under the accumulated weight of ice. Rural areas were without power for weeks, with even the more heavily populated areas taking many days to be back on line.

As might be expected, there was an epidemic of fires as people used alternative methods to heat and light their homes. So I was not surprised when I was asked to look at house fires in the affected area. But, much to my surprise, the fire in the single family dwelling was centered around the main electrical panel and not from a portable heating device.

The occupants indicated their power had been off for several days but there had been sporadic attempts by the power company, to get it back on. Their lights had come on for short periods, then went back off. During the night they were awakened by a loud bang (probably from a nearby electrical substation) and an accompanying "whoosh" and orange glow outside their bedroom window. They then realized the house was full of smoke and they exited the house.

This fire investigation looked easy in that all the fire damage was located at the electrical panel in the utility room. It was noted that the bare copper ground wire, which ran from the panel to a nearby gas water heater, was loose but undamaged. The fire started at the panel and ignited surrounding combustibles and spread out of the utility room. The nearby gas water heater was not involved in the fire.

It was then the occupants started talking again about the orange glow outside their bedroom window and how the gas meter had exploded. They were adamant the "gas explosion" had caused the fire in the utility room. This was a bit bizarre, but a quick inspection showed the gas meter missing, the line cut off below the connector, and the gas line capped off. This was somewhat unusual as the local gas company usually just turns off the meter and doesn't remove it after a house fire. Even if they remove the meter, they don't cut the lines. There was no evidence of fire damage around the area of the meter, which was not surprising as the wall near the meter was constructed of brick veneer.

A trip to the local gas company was really interesting. The gas meter was indeed damaged. It was as if someone had taken an oxyacetylene cutting torch to the coupling between the gas supply pipe and the regulator/meter. Natural gas alone cannot do such damage and there was no evidence of anything else doing it. A real mystery...

It was pretty obvious that an electrical arc had caused the damage, but how? There were no electric lines in the vicinity of the gas meter. After a little thinking and some discussion with the gas company, here is what happened:

1. The power company was attempting to energize lines which had been felled in the ice storm. Somewhere in the system the three wire system, consisting of two "hot" wires and the neutral which formed the typical "drop" to this house, were crossed. The neutral became energized, for a short time, and normally would have simply gone to ground. Such may have set the electrical box on fire, but due to the sound wire to the box being loose, there was nowhere for it to go.

2. Somewhere in the house, an electrical ground was made to a gas pipe. As a result, the gas piping in the house was energized. But it didn't have anywhere to go either.

3. The house gas piping and the underground gas distribution piping are electrically isolated at the regulator connection. The underground system is cathodically protected by a small DC voltage which does not need to enter the house, a plastic washer goes between the supply piping and the meter to isolate house piping from the underground system.

4. The isolation insulator is not designed for or capable of handling the 110 or 220 vac (or other voltage) which was impressed on it. That, coupled with a coating of ice and moisture, provided a ready path for a ground fault. The resulting current arced across the insulator and burned a hole in the gas piping and then ignited the escaping gas.

It was a rather spectacular show, a 15 foot ball of fire fed by 13 psi natural gas, which would have ignited the house had it not been for a brick veneer wall. Had the fire completely burned this house it would probably have gone down as a problem with the gas meter, although the real problem was with the electrical service.

So things aren't always as they seem, a thorough look at artifacts, conversations with witnesses, external circumstances and conditions, and knowledge of the overall scenario can often times make a significant difference in what the fire investigator concludes.

FIREFIGHTER RELATED ARSON

(Do firefighters start fires? Do we have to worry about Roger Bucholtz and Brian Neal? This article is from the March 1995 Newsletter of the Pennsylvania Chapter of the IAAI.)

On November 8, 1994, a conference call was conducted regarding the degree of "Firefighter Related Arson" that exists throughout the United States. The conference call resulted from an inquiry made by Stephen Austin, the IAAI External Affairs Representative.

The conference call included the following individuals:

Stephen P. Austin	IAAI
John Barracato	IAAI
Timothy Huff	FBI
Lou Iliano	ATF
Ken Newton	National Volunteer Fire Council
Fred Nesbitt	International Assocn. of Fire Fighters
Carl Peterson	NFPA
Andrew Giglio	U.S. Fire Admin.
James Covington	U.S. Fire Admin.
Thomas E. Minnich	U.S. Fire Admin.

The conference call was conducted as an open forum. All participants offered their views regarding "Firefighter Related Arson."

Stephen Austin stated that he had asked for a meeting to try to determine how extensive the problem of firefighters being involved in arson might be, and then to develop strategies to address the issue. He related the concern he has developed from negative publicity regarding firefighter arson.

John Barracato stated that in his thirty four years of dealing with arson he could only attribute about 1% of those arsons to firefighters. He stated there is no doubt it does happen but not on the scale that would be considered to be epidemic in nature.

Tim Huff stated that he has conducted a limited study on the issue and has had the paper published in several periodicals.

Ken Newton stated that NVFC sent a survey to every state regarding whether they had experienced a widespread problem with firefighter arson and he related that the survey indicated it to be very spotty.

Fred Nesbitt stated that if there was a weak point in selecting firefighters there needed to be a better screening process in place regarding criminal records check. He related that there are instances in the volunteer fire service area when individuals are allowed to become firefighters with no background check at all. Mr. Nesbitt thought that this would assist in identifying potential problems.

Carl Peterson stated that we must keep in mind that small volunteer fire departments have a recruitment and retention problem and in towns and cities of less than 2500 in population the fire department is a family affair.

Lou Iliano was asked if there was a way to check ATF investigated fires in which firefighters were suspected. Mr. Iliano stated he would ask agents to check the last two years of fire suspects.

A lengthy discussion followed. The conference participants agreed on the following points:

- A conference or central collection of data on firefighter related arson could lead to a suspicion that we are collecting data because we are extremely concerned about the problem, when in fact, there is no widespread problem.
- In essence, the participants thought we would be creating a problem.
- The panel agreed that efforts should be focused on requiring more extensive screening or background checks on firefighter applicants.
- The panel is against convening a nationwide meeting as it could bring attention to a problem that does not exist.
- The panel agreed that if there is a local problem with an incident involving a firefighter committing an arson the organizations represented could be contacted for information and strategies on dealing with the problem.

(Editor's Note: Looks as if Roger and Brian are off the hook this time.)

WHEN TRUTH IS AS STRANGE AS FICTION.

(This is part of a paper presented at the 1995 IAAI Annual Conference held in Los Angeles.)

Spontaneous human combustion was such a well-known phenomenon during the late 18th and 19th Centuries that a number of authors used it to dispose of some of their fictional characters.

In Charles Dicken's Bleak House, published in the mid-1800's, Krook, an old, cadaverous, ginsoaked rag and bottle merchant, dies gruesomely of spontaneous combustion. Krook was a symbol for all the social evils and inequities then rampant in England, and through his horrible death Dickens prophesied the self-destruction of "all authorities in all places under all names soever, where false pretenses are made, and where injustice is done." The chapter depicting Krook's demise concluded:

Call the death by any name (you) will attribute it to whom you will, or say it might have been prevented how you will, it is the same death eternally inborn, inbred, engendered in the corrupted humours of the vicious body itself, and that only Spontaneous Comb-stion, and none other of all the deaths can be dies.

When the installment of the serialized Bleak House appeared, the literary critic George Henry Lewes severely chided his old friend Dickens for perpetuating what he felt to be a vulgar and unscientific superstition. But Dickens vigorously defended the reality of spontaneous combustion, citing many documented cases, including those of Mme. Millet of Rheims and of the Countess di Bandi as well as his own memories of inquests he attended when he was still a young reporter. Later, when Bleak House was reissued as a single volume, Dickens continued to defend the authenticity of spontaneous combustion in his foreword:

I shall not abandon the facts until there shall have been considerable testimony on which human occurrences are usually received.

The earliest literary account of spontaneous combustion is from the 1798 novel Wieland, written by America's first novelist and master of the Gothic, Charles Brockden Brown. The main character is a Gerrnan pietist who observes the mysterious solitary rites of his religion in a tumble down wooden shack he calls his chapel. One night his wife is startled by a bright light that bursts above the chapel and by a "loud report like the explosion of a mine."

She hears a horrible shriek, but by the time she gets to the shack, the light and cries have died away. She finds Wieland "insensible," his clothing in cinders, his body frightfully burned, but the chapel unharmed. The wretched man dies after terrible suffering:

... the disease, betrayed more terrible symptorm. Fever and delirium terminated in lethargic slumber... Yet not until insupportable exhalations and crawling putrefaction had driven from his chamber and the house everyone whom their duty did not detain.

In Frederick Marryat's 1834 novel Jacob Faithful, the hero's mother is a victim of spontaneous combustion. In his account Marryat closely followed the details of an 1832 case reported in London. Jacob enters his parent's cabin aboard a barge on the Thames:

The lamp fixed against the after bulkhead, with a glass before it, was still alight, and I could see plainly to every corner of the cabin, nothing was burning - not even the curtains to my mother's bed appeared to be singed..there appeared to be a black mass in the middle of the bed. I put my hand fearfidly upon it - it was a sort of unctous pitchy cinder. I screamed with horror..I staggered from the cabin, and fell down on the deck... She perished from what is called spontaneous combustion, and inflammation of the gases generated from the spirits absorbed into the system.

In Gogolo's Dead Souls (1842) there is a regretful mention of the death of a blacksmith combined with relief that the smithy itself had not burned:

He caught fire himself. Something inside him caught fire. Must have had too much to drink. Only a blue flame came out of him and he smoldered, smoldered, and turned as black as coal. And he was such a clever blacksmith ...

Herman Melville, too, used the device. In Redbum (1849), Miguel, a shanghaied sailor, is found on deck in a stupor, drunk and stinking. As the rest of the horrified crew note:

... two threads of greenish fire, like a forked tongue, darted out between the lips and in a moment, the cadaverous face was covered by a swarm of wormlike flames... the uncovered boy burned before us, precisely like a phophorescent shark in a midnight sea.

And Thomas de Quincey, in the 1856 revised edition of Confession of an English Opium-Eater, included as one of the "Pains of Opium" the fear that the narcotic, like alcohol, might result in spontaneous combustion and that he might himself take leave of the literary world in that fashion.

The mysterious fiery death was also used by Mark Twain in his Life on the Mississippi (1883):

Jimmy Finn was not burned in a calaboose, but died in a tan vat, of a combination of delirium trermens and spontaneous combustion.