Special Edition

Firepoint

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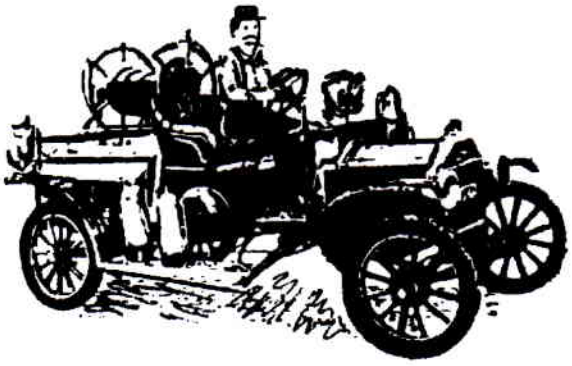

President's Message

Welcome to this special edition of "Firepoint" magazine. The Committee of the New South Wales Association of Fire Investigators has decided to provide this special edition to you with a view to outlining some of the issues that have been provided for discussion by various authors over a number of years. Having won an international award for this publication in the Fire Investigation area, we are very proud of "Firepoint" and the service it provides to members.

Today, there are a great range of people involved in the investigation of fires and the ongoing court matters associated with those investigations. The investigation of fire doesn't stop at the fire scene itself and as is readily identified, factual investigation where interviews and statements are taken, are the follow up to fire cause determination.

From there, decisions are made in relation to prosecution or litigation which then also involves the insurance industry and legal professions.

I first began conducting forensic examination as a member of the New South Wales Police in 1983 and continue to this day although now in private practice. In my earlier association with forensic examination, there were no specific tertiary courses associated with forensic examination let alone fire scenes. At that time, and continuing today, the ongoing development and education of members was n a more personal choice decision where anyone could apply and be accepted as a member of the International Association of Arson Investigators. Some members travelled to the USA for conferences but most most read the publications here in Australia.

From that original association, we had a number of foundation members who in the 1980's saw fit to either contact or themselves travel, to the United States of America for further education in the area of fire examination and more particularly origin and cause determination. From there, the International Association of Arson Investigators Chapter 47, being New South Wales was established.

That name was later changed to the Association of Fire Investigators to more properly recognise the role investigators have in the investigation of fire, rather than only arson related matters.

In outlining that brief history to you, and in acknowledging the foundation members who set up this Association, I would like to encourage you and invite you to join the Association for the many benefits it has for you, the reader.

Through courses of study, many texts are available that can relate to the forensic examination of scenes. Whether they be blood splash pattern interpretation, ballistics, crime scene examination or fire scene examination, those texts are readily available for reference. Of note however is the invaluable experience of professionals in the field who on a day to day basis are involved in the examination and investigation of fire matters.

Those professionals bring to you and I, their opinions and experience in columns, conferences and education nights which may not only identify unusual facts, but also broaden our thinking in regard to the parameters and considerations which

we might or should have, during our consideration of the facts associated with fire examination.

Experts in the field of metallurgy, chemistry, electricity, law, the judiciary, fire fighting and spontaneous combustion are just some of the areas where we can gain invaluable assistance and knowledge in considering the information they have provided to us. "Firepoint" magazine is a great mechanism and tool for the ongoing education and at times entertainment of all of our members. I can indicate that although we encourage articles or columns to be submitted, at no stage are they fully endorsed by the Association. Most of the time, the submissions are forwarded for inclusion so that you and I can take on-board the opinions of other examiners or investigators, their findings and how that may impact on matters that we are involved with in the future.

The method that is utilised in relation to scene examination or even some of the cross examination that they are sometimes exposed to, provides an arena for further consideration of the notes and records that we may keep or consider obtaining, during an examination which may again more properly prepare us for future court attendance and the giving of evidence.

Of course you may be asking *"Well, why is this Special Edition forwarded to us?"* Without doubt, we believe that the area of forensic examination and in particular in the areas of police, fire brigades and private sector examiners and investigators are areas which continue to be important roles in investigations, and in particular criminal investigation.

For as long as the world has existed, greed has been part of the human experience. Whilst greed exists, the potential for fraud exists. Outside of greed however, in tough economic times, people are often pushed to situations where they would make decisions often involving the deliberate destruction of property by fire or explosion that they might not normally undertake.

Conversely, the accurate determination of either deliberate or accidental fire causation impacts not only on the freedom of the individual, but on their families, finances, homes and businesses. Prolonged litigation involving fire determination has seen peoples lives destroyed. You and I are, I believe, obliged to be committed to our professions and the people who rely on our findings to 'get it right' in light of the ramifications that can follow.

Because of our ongoing involvement, we would like to use this publication as a mechanism to inform you of the New South Wales Association of Fire Investigators to invite and encourage you through this Special Edition to become a member. For those of you who are already members, may we as a committee thank you for your ongoing commitment and support throughout the years. For the many people who have been members in the past and who have contributed to the Association, we thank you for your involvement which has not gone unnoticed and we would welcome you back.

As you read through the various articles that have been supplied in this special edition, I encourage you to consider the information from each of the authors and how that may impact on your day to day operations. I would also encourage that you may be of a mind to

critique that information with a view to how you operate or how the author may operate or the information they have provided.

I believe that those considerations are a healthy medium for the ongoing development and education of people involved in this field. I look forward to being involved with the committee and the receipt of your application to become a member of the New South Wales Association of Fire Investigators. I can assure you that membership has been a very worthwhile experience, which you will also gain from.

Ongoing support of our members includes the benefits of discount publications such as Kirks Fire Investigation and NFPA 921. The networking and communication is invaluable to a career in these industries. Our Association merchandise allows us to be readily recognised as members of a collective body committed to furthering the education of people involved in fire investigation.

Members also are recognised by reduced fees at conferences and have of course the ability to stand for the committee or executive positions.

May I wish you all the best with your future careers and look forward to seeing you at our education nights which are regularly held and are now being extended to regional areas.

In April this year, we will have our first education night conducted in the ACT. I believe there is scope to extend this avenue of further education with a hope that should the numbers permit in the not to distant future, that we could head north with consideration being given for the education nights to be provided and supported in the Central Coast or Newcastle region.

We look forward to seeing you at our conferences and particularly in 2010 where a National Conference is now scheduled to be held. Please visit the Association website for any communication or feedback you may have as we look forward to the receipt of your anticipated membership application.

Yours Sincerely,
Greg Kelly
NSW President.

Editor's Message

As you can see, we are printing in this issue photocopies of a variety of articles from the magazine over the past 20 years.

I have chosen only articles of 1-2 pages length. There are often far more comprehensive articles, but shorter articles have been chosen to conserve space.

We have had articles from lawyers, scientists, police, fire brigade members, electrical engineers, insurance office staff, and others.

This shows the diversity of this area of investigation, and its complexity. That is why it is good to be part of this organization: to be able to network with such a divergent group, and to learn from experts in a variety of areas.

The cost of membership is $40 per annum. To join, fill in the Application Form on the back cover of this magazine, and forward it to the NSW Association, whose address is shown in the bottom right hand corner of page 3.

If you have any queries, contact us by phone or email on the numbers shown there.

International Accelerant Detection Canines

Phil Etienne
Fire and investigation Research Unit
NSW Fire Brigades

Whilst attending the IAAI Conference in Denver 2006 I met with Agent Jerry Means from the Colorado Bureau of Investigations and his K9 'Erin'. Agent Means delivered a demonstration with K9 'Erin' prior to my presentation.

'Erin' is a passive alert food reward K9 trained by the Maine State Police. This is a different system to what I use here in Australia, however, achieved the same result.

From speaking with Agent Means and other Canine Handlers during and after my presentation it was apparent that most of the ADC's in the USA, are on the food reward system.

It was also apparent that most of the canine handlers were having similar difficulties with scientific results coming back contrary to the canine alert.

A difference with my Canine, is that during the demonstration Agent Means placed a drop of 10 micro litres of 50% evaporated gasoline in various spots and on peoples shoes for 'Erin' to find.

The great news is that K9 'Erin' alerted on all the drops. With my K9 'Ellie' I use .05 micro litres of 90% evaporated petrol during these similar demonstrations.

Ellie is trained to detect such low levels, which is why it is difficult for the scientific laboratories to detect or achieve the same result.

After my presentation I arranged for two laboratories to conduct similar tests (that were conducted on Ellie during Sonia Casamento's PhD thesis) utilising Canine teams from separate agencies and monitored by an independent testing facility or university.

I have since been informed that only a small amount of the tests have been conducted and they will soon compile an interim report.

During the conference I met with Accelerant Detection Canine handlers from Federal, State, County, Fire, Police and Private agencies. It was during these meetings that I discovered that the NSWFB are leading the way with Active Reward AD Canines.

Some of these agencies explained that when a lab result comes back negative from samples taken from were their canine alerts, they do not present evidence in court. I was unable to see the point of this, and most professional canine handlers who operate and train detector dogs would insist "trust your dog".

Not only do you need to constantly train, assess and calibrate your canine you need to establish a partnership with your laboratories, to ensure they understand what your canine is capable of, but work together to achieve greater results.

After the conference I flew to Virginia to meet with Handlers from the U S Department of Justice Bureau of Alcohol, Tobacco, Firearms and Explosives (ATFE) and

agents from the Federal Bureau of Investigation (FBI).

I travelled to ATFE's Canine Training and Operations Support Branch, Front Royal, and spent time with Gary Adams, Instructor/Canine Trainer.
It was here that I was able to see their canines going through the

development and scent imprintation stage of their training. The training facility and Canine Kennels were an amazing and awe inspiring sight.

Gary spent a lot of his time showing me around and explaining the process as to why food reward is the system they have chosen and will not sway from.

This was a great opportunity for me to see a number of canines training and working together, allowing me to adopt a lot of their group training methodologies even with a different reward system. I was impressed with both the facilities and the drive levels of their canines. But it was not enough to influence my opinion away from active reward methods

I then travelled to Washington DC and meet with agents from the FBI, who operate Accelerant Detection Canines and are keen to try and adopt different training and reward methods.

They were very interested in the process to which we acquire canines from Australian Customs. I spent time showing them how my reward system keeps the canine enthusiastic, with the ability to maintain the drive levels during all hours of the day.

The system that I use takes away any temptation regarding food, which is common in most fire scenes, thus minimising further chances of false alerts or the interpretation of any false alerts from judicial systems whilst presenting evidence in court.

The reward system I employ only utilises play, game and tone. It is the handler who can either make or break the canine and must ensure their drive level is higher every time he/she deploys the canine, and their enthusiasm level hits high peak every time the canine alerts.

I then went and spoke to a small group of personnel from the FBI U.S. Customs, U.S. Marines and Fire Services at the FBI training centre in Quantico, Virginia.

It was here that I again highlighted our success with the 'Ellie' (passive alert / active reward) with detection accuracy, court proceedings, PR and as a visual deterrent thus reducing risks to our community. I initiated a new training program/project to trial active reward canines within these agencies.

These canines are not "active in service" yet, but the training/project is being seen as successful at this stage.

I am not and did not whilst in the U.S., state that play reward is better than food reward, however, the NSWFB have reaped the benefits of adopting this methodology and will not be moving away from it especially when deploying canines in the environments we work in.

The trip enriched my knowledge and skills in canine care, training and deployment. I believe I influenced a number agencies in adopting the methodology we use in Australia.

It established close and much needed international networks that can share information and techniques to improve the way we utilise the specialised tools.

BUILDING THE PLATFORM FOR A SUCCESSFUL INTERVIEW

Drew Lindsay

Based on a lecture recently given to Claims Staff from Royal & Sun Alliance and Tyndall Life, Sydney, concerning the steps to a successful interview.

As Insurance Claims Staff and in particular, Insurance Investigators, it is unwise to simply launch into an interview with a person who has lodged an Insurance claim, without taking the time to fully assess the specific situation, and taking time to build the steps to the platform on which the interview will occur.

This 'platform building' process is relevant in phone contact by Insurance Claims Staff with an Insured, but more so when a face to face encounter is to ensue.

In more than 2 decades of conducting interviews I have learned that there are four basic steps which the interviewer should take prior to taking his/her laptop or more appropriately, tape recorder, from the brief case and commencing the interview.

STEP ONE

It might sound a bit simplistic, but one must thoroughly read all information relevant to the Insured, including the Proposal Information, Claim Form and the Claims file generally. This is where the Claims Handling Officer can be of great assistance to the Investigator.

The Investigator initially has to know as much as possible about the Insured as can be made available. The following information is vital.

AGE
GENDER
NATIONALITY
OCCUPATION
MARITAL STATUS
PLACE OF RESIDENCE

The reason you need to know the age and gender of the Insured is because that will determine how you initially speak with them during that vital first phone call, and it will also dictate how you conduct yourself during the interview.

My father always told me that it was proper to respect one's elders. I'm not sure that the advice works generally in every situation, but it seems to me that if you are interviewing someone who is quite a bit older than yourself, then it is wise to at least attempt to communicate the fact that you are aware and appreciate that they have more experience in life generally than you, even if you have crammed more living into your years than they.

Young and in-experienced investigators often tend to overcome the age barrier by being over assertive or even aggressive and intimidating, right from the first contact, hoping that it will give them the AUTHORITY to carry them successfully through the interview.

Real AUTHORITY is earned over time, and has little to do with being aggressive or intimidating. It does not come with a piece of paper with a red seal thereon, or your fancy business card.

Be aware of who you are in relation to the person you are to interview. Continue to honestly monitor yourself.....your age, experience and ability and be prepared to make adjustments specifically geared to the person you are to confront.

STEP TWO

The initial phone contact with the insured is very important. If that goes wrong, the subsequent interview will probably be unsuccessful.

As soon as an Insured knows that their claim is 'under investigation' they will experience a number of emotions - ranging from straight out anger, to fear, anxiety and resentment.

If the Insured is attempting fraud, the range of emotions felt may be amplified. If the Insured has done nothing wrong, they will still feel that the Insurer has declared them dishonest, simply because they are now 'under investigation'.

Insurance Investigators will probably spend more of their time confirming genuine claims than exposing fraudulent claims. We must therefore, NEVER pre judge any claim, even if numerous fraud indicators are present.

Getting back to that first vital phone call..... Be pleasant. Don't use statements such as "your claim is under investigation" or "there are very suspicious matters associated with your claim."

I don't believe the insured should be lulled into a false sense of security by initially sweet talking them so that you can pounce on them later during the interview. They obviously know there is a problem, or you wouldn't be on the phone in the first place.

If there are major problems with their claim, in most cases they should be told about this, but that is perhaps best left for the actual interview process, rather than the initial contact. Initially however, make them aware that the Insurer requires some further inquiries to be made, but don't make it sound like the Spanish Inquisition.

STEP THREE

The face to face meeting is the final step to building the platform on which the formal interview will commence. There is a fourth step, which I will cover shortly, but it is actually taken well before the first step.

Generally you will be on the Insured's territory for the interview, and I personally believe that this is the appropriate venue for most Insurance type interviews to be conducted.

It will be in the insured's home or office, and that can be somewhat intimidating for the young or inexperienced investigator. If you are in that category, resist the urge to strut in all official and full of authority in order to compensate for being in unfamiliar territory.

It's their ground, so let them have that advantage for a while. It will make the insured feel more comfortable and ultimately give you a better basis for a successful interview.

Resist the urge to direct them to a specific chair at the table, or to burst open your brief case and stack up very official files and a rather menacing tape recorder in their face. Just relax and let them direct you about for a little while.

Chat about things which initially have nothing whatsoever to do with their claim. They need time to check you out. If you're game, pat their dog and if their cat tries to jump on your lap, don't grab it by the throat and hurl it across the room.....even if you hate cats.

I've had so many people quickly warm to my presence because their dog liked me, or because I commented on their choice of movies.

Be honest with the insured as to the purpose of your visit, and if there are problems with the claim which have to be addressed, do it openly..... but don't rush things. You're in what I term, 'a mini relationship' with each and every interviewee, and the basis for you're presence has to be established as smoothly and efficiently as possible.

STEP FOUR

This should go without saying, but please pay attention to your grooming and dress.

Years ago when I was a junior Detective within the NSW Police Department, and working in some fairly rough areas of Sydney, I learned a subtle lesson from some very smart Detectives concerning 'Physical Presentation'.

Most professional people should appreciate what this means, especially working in the Corporate Sector, however let me underline the fact that if you have bad breath, dirty fingernails and a crumpled suit which hardly fits, you may have your professional ability aligned with your general appearance.

COMMENT

If the above four steps are followed, no matter what your experience, qualifications or age may be, you will have built the platform on which the very vital interview with an insured, can be conducted.

SAFETY BULLETIN

THE HIDDEN DANGERS OF FIRE INVESTIGATION

Investigators and other interested parties should be fully aware of the dangers posed on entry into a fire scene after the fire appears to be out.

The risks posed by gases and vapours during the smouldering phase of the fire should not be ignored.

There is substantial evidence showing that significant health risks do exist during the smouldering phase, but because those risks aren't as immediate as during the flaming stage, we tend to accept them and be less conscious of safety.

During the smouldering phase the risk changes from an immediate risk to health with an acute affect (due to heat, smoke and high concentrations of toxic gases), to a long term risk (presenting a chronic exposure hazard to personnel). The repeated dose exposure to chemicals does eventually cause health problems, particularly when those chemicals build up slowly in our bodies over a number of years.

Many of these chemicals are carcinogenic and/or systemic poisons and they are still being produced by incomplete combustion when the fire is smouldering.

We believe that there is definitely a need to start changing the culture of investigators to raise everyone's awareness of the hazards of working in a fire during the smouldering phase of the fire.

The use of self contained breathing apparatus (SCBA) is not always possible, however there are other ways of minimising the level of exposure and from an industrial hygiene perspective. There are many ways that this can be achieved.

It can be achieved by increasing the air flow through an area to disperse gases and vapours more quickly (**ventilation**), by minimising working times and maximising rest periods (**reduced exposure**), by using good hygiene practices and ensuring that all staff wash their hands and face before they have refreshments or before smoking (**decontamination**), and by wearing items such as dust masks and eye protection where SCBA is not practical (**personal protection**).

We need to protect ourselves against atmospheric contaminants containing toxic materials, including dioxins, some of which are the most toxic substance ever produced by man.

It's not only that loose tile on the roof or the weak floor boards that we need to be careful of. It's the less obvious dangers in the air we are breathing that could have the greatest adverse effect on your health.

Don Walshe & Peter Stacey
N.S.W.F.B. FIRU & HAZMAT.

A simple message, but one which all who visit fire - scenes should heed. It can guard your health.

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.

AEROSOL PROPELLANTS

by Wal Stern,
University of Technology, Sydney

(This is an article printed in Fire and Arson Investigator in December, 1995, and a summary of the responses received to the article, as published in the June, 1996 issue of Fire and Arson Investigator)

In Sydney we have had a number of incidents (fires or explosions) involving aerosol packs, used to control insects ("cockroach bombs").

These pressure packs have been around for some time. In the case of an insect infestation the recommendation is to close up the dwelling as much as possible, and spray the pressure packs where necessary.

In the past the propellant in these aerosol packs have been chlorofluorocarbons (CFCs). They are good propellants, and present no fire danger (in fact, some CFCs are used in fire extinguishers). However, CFCs are now being phased out, as they are believed to be a contributory factor to the depletion of the ozone layer in the upper atmosphere.

Ozone is a nuisance in everyday life (it is one of the causes of rubber gloves perishing, the reason why Aids workers wear double gloves or special gloves), but its presence in the upper atmosphere protects us from harmful ultraviolet radiation, and cuts down on skin cancer. It is believed that CFCs float up into the stratosphere, break down under the influence of ultraviolet light to give chlorine radicals (amongst other things), which react with ozone and destroy it. Hence, we are phasing out our use of CFCs.

So far so good. But what do we replace them with? At least one manufacturer of "cockroach bombs" has replaced those propellants with a mixture of hydrocarbons, predominantly propane, isobutane and butane. The manufacturer proudly notes on the can that they have replaced the CFCs, for environmental reasons, but they have at the same time produced a fresh hazard. When the current pressure packs are emptied, gaseous hydrocarbons are released and sprayed around. In one house I went to, the owner had sprayed 15 cans at the one time, throughout the length and breadth of the house. This left a large volume of potentially explosive gas floating around the house. Propane, by way of example, has flammability limits of around 2 to 10 percent; that is, any mixture between those limits is potentially explosive, only needing a spark to go off.

Of course in houses, there are lots of sources of flames and sparks. The packs warn, in small print, that refrigerators should be turned off, as well as all flames and pilot lights (e.g. gas heaters). I don't think that's good enough. People don't read the fine print. Furthermore, I believe the electricity would have to be completely turned off at the main to stop sparks; these could occur at any time, at a power outlet, a poor connection or a frayed cord.

The substitution of hydrocarbons for CFCs may help the ozone layer, but it is presenting us with a new danger from the point of view of fires and explosions. In terms of fire, the continued and expanding use of hydrocarbon mixtures as propellants represents an enormous potential for danger. It would be better if hydrocarbon propellants were not used. One solution would be to replace such aerosol packs altogether by other spray methods.

A summary of responses received.

The respondents confirmed the dangers noted, and gave instances of fires and explosions in a variety of different situations, as a result of ignition of the hydrocarbon mixtures.

The potential for disaster from this source was highlighted by a note from Shalom Tsaroom, Head, Arson Investigation Unit, Israel Police, indicating that aerosol containers holding a mixture of hydrocarbons had been a popular device used by terrorists for the past several years.

A number of respondents gave examples of explosions which occurred when large numbers of insecticides and propellants were released in close proximity to pilot lights, specifically from heaters. It was noted that warnings on labels were not read and/or were misunderstood. In the case of the release of multiple cans, each containing around 35% propane, isobutane and butane, near any naked flame or spark, an extremely dangerous situation obviously exists.

There were also a number of cases cited, where the release of three containers had led to a destructive fire. I was concerned at the number and variety of fires reported to me as the result of just one aerosol container, often not an insecticide. For example, there were reports of single containers, one left on top of a kerosene heater, another on a shelf above the gas stove, overheating, venting, and causing an explosion of the propellant gas. One response reported that a single rusted can had leaked, in the vicinity of a naked pilot light, and caused a fire.

The conclusion appears to be that hydrocarbon propellants, even from a single can may cause explosions and fires, if the propellant gases escape or are let out near flames and sparks. Non-ignitable propellant gases are definitely safer, with respect to fires and explosions, and efforts should be made to use environmentally friendly non-ignitable propellants. In the meantime, aerosol containers with hydrocarbon propellants must be stored away from sparks , flames, heat and water, and released away from sparks and flames. Warnings on containers need to be large, and simple to understand. In the short term, more fires and explosions of this type are to be expected.

ELECTRICAL INDICATORS AT THE SCENE

Identification – Recording - Collection

Russell F Lee FIEAust CPEng

STAGES IN AN INVESTIGATION

- Accept the assignment
- Receive a briefing
- Gather information
- Scene examination
- Debris examination
- Product examination
- Analysis and testing
- Opinion formulation
- Reporting data and opinions to clients

Speed is the essence. The sooner you get to the scene, the easier your job will be.

Others may be there before and after you and may still be there. Cooperate & learn.

Evidence may be destroyed, moved or lost.

The owner will be anxious to clean up.

A demolition order may be in place.

Remember the owner and tenant are still the owner and tenant.

- Examine the scene
- Take a broad walk around
- Take a close in walk round.
- Enter the scene
- Broad inspection
- Detailed inspection
- Detailed inspection of the area of origin
- Broad view
- Detailed view

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RECORDING THE SCENE

- Always sketch the scene, and particularly the area of interest.
- Show all switchboards, meters, main cable runs, lights if of interest, power outlets and switches.
- Photograph the scene. Take photos before evidence is moved.
- Take more photos rather than fewer photos.
- If scene reconstruction is used, record the existing scene first.

A SINGLE LINE DIAGRAM

- Where-ever it is possible produce a

single line diagram for the installation or in the case of larger installations, obtain the site drawings.

- The data may enable a more detailed understanding of the advance of the fire by reference to the protection arrangements.
- Simple diagrams help place faults
- Determine the area of origin and the origin of fire first. Then look for ignition factors.

FUSES, CIRCUIT BREAKERS & RCDs

- Over-wired fuses
- Wired cartridge carrier
- Circuit breaker toggles
- CB toggle positions

Horizontal mounting. Open is downwards.

Vertical mounting. Open is away from busbars

- Hot Connection at a fuse
- Don't forget the fuses in electric stoves and ovens, microwave ovens, TV sets, DVD & CD players, stereo amplifiers, clock radios, projectors, computer power supplies.
- Don't forget the thermal overloads and cutouts in refrigerator motors, dryer motors, washer motors, dryer heater elements, coffee machines, water heaters, hot water boilers.
- Don't forget the capacitors in single phase motor systems, the capacitors in light fittings, fluorescent ballasts, in electronic transformers and ballasts

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- Check for arc & other melts.
- Check the supply.

DO NOT BELIEVE ANYONE WHEN THEY SAY THE SUPPLY IS OFF. ALWAYS CHECK IT YOURSELF. IT IS YOU WHO WILL BE HANDLING THE CIRCUITS.

Finally,

- Much of the debris and many of the artefacts you discover will be fragile and fire-damaged, with often some parts missing.
- Treat such items with care. Photograph first. Bag carefully.
- If you are unfamiliar yourself with the artefacts, save them for someone who does know what they are and mean.
- Unless you are electrically qualified, the best thing you can do is preserve the evidence.

SCENE SAFE.

By Inspector Bill Powell

NSW Fire Brigade, Fire Investigation and Research Unit

This article is designed to inform Firefighters about two types of construction utilised in modern houses (Building Code of Australia Class 1), that may have an adverse effect on their safety.

The safety issue doesn't concern those involved in construction of the building but on the eventual end user, the residents, and most importantly on members of the fire service, who may need to enter the building during fire fighting operations.

Visually these types of houses appear to be like any conventionally built timber framed cement rendered structure.

Type 1 – Orientated Strand Board
(See Photos 1 and 2)

Orientated Strand Board is an engineered wood product. It is manufactured in a cross-orientated pattern similar to ply wood, to create a strong, stiff structural panel. It is composed of thin rectangular shaped wood strands arranged in layers at right angles to one another, laid up into mats that form a panel, bonded with fully waterproof adhesives.

In the first phase of orientated strand board manufacture logs are debarked and cut to a uniform length. The logs are then turned into strand wafers.

The strands are dried with heat in a large rotating drum and screened to grade strands that are the correct size. The dried strands are sprayed with liquid or powder resin and then transported in layers on a conveyor system to a forming line, where the layers are cross orientated into mats.

For face layers, the strands generally run along the panel, while for core layers, the strands are randomly orientated or run across the panel. The mats are trimmed to a workable size, then moved to a press where the wood strands and glue are bonded together under heat and pressure to create a structural panel.

For the past two decades orientated strand board has been used for residential and non-residential construction in America.

Now this type of house construction is occurring in Australia.

Prepared orientated strand board panels approximately 15 mm in thickness are stapled to timber studs to form exterior walls. No noggins are required in the support frame.

These walls are later covered by wire mesh and are cement rendered. Buildings also utilise orientated strand board for flooring (specially rated for flooring) and roofing. The roofing panels are externally clad with bituminous style tiles (Pabco Premier 25).

Upper level floor trusses (support joists) are constructed in an "I-Beam" configuration using orientated strand board for the web, and laminated veneer for the flanges of the joist.

Due to this type of floor joint construction, it is suspected that when there is a fire there is a loss of structural integrity, and the weight of the upper level may cause premature collapse. This is especially so if the fire

has caused internal plasterboard linings to fail, exposing the timber joists.

Remember also that a lot of plasterboard ceilings and walls in modern construction are now glued and not nailed to the timber supports. Consideration should also be given to the added combustible fuel loading created by this form of building material.

Type 2 – Polystyrene Foam Blocks
(Photos 3 and 4)

Polystyrene foam blocks or sheets, of approximate thickness 75 mm are being fastened by galvanised large head nails (roofing style) to the timber framing of houses, forming the exterior walls.

These walls are later cement rendered, over a plastic mesh – the roof being tiled. In a north western area of Sydney, this type of construction has been used in the building of two level townhouses connected in groups of four, three and five.

The common adjoining wall for each occupancy was constructed by hollow polystyrene blocks, being permanent form work, and these were then in-filled with concrete.

The outer wall thickness of the block is approximately 55 mm, total thickness of the finished wall is approximately 250 mm. This single wall extends the height of both levels.

Upper level floor trusses (support joists) are constructed in a "I" (hybeam) configuration using laminated veneer.

These joists are "gang nailed" and dyna bolted to the concrete wall, the polystyrene form work having been cut away to expose the concrete surface.

Again, in a fire situation premature structural collapse of flooring supporting of the upper level may occur. With the displacement of plasterboard internal linings, burning polystyrene foam has the characteristics of melting and dripping as it burns, enabling easy fire spread to other combustibles. Due to the large vertical surface area exposed, rapid and severe fire development can occur.

Enormous quantities of thick black smoke is generated contributing to making fire fighting activities dangerous, and may necessitate evacuation of residents from nearby properties.

In a fire involved or fire damaged structure the collapse of the common concrete dividing wall is always imminent, this being synonymous with a "tilt up" slab in commercial or industrial premises.

A recent serious fire in Melbourne, involved polystyrene form work being utilised for the construction of concrete lift shaft walls, within a 20 level building, which was undergoing refurbishment.

Conclusion

The main concern for these types of building components and construction method is the life safety risk to firefighters who may have to make an entry to a building constructed in this fashion, without the knowledge that this type of construction is employed.

This construction method cannot be determined by external observation. The only way to tell is to have prior knowledge of the building construction.

MELBOURNE SHOWROOM FIRE

A Case Study submitted by Melbourne Metropolitan Fire Brigade Fire Investigation Officer Alex Conway.

On the 30th March 1998 at 1903 hrs Units from the Metropolitan Fire & Emergency Services Board responded to an exchange telephone call for a fire at 245 Racecourse Road Flemington.

Fire appliances, on arriving at the scene were faced with a fire in a 2 storey tilt slab concrete building 50 metres X 50 metres. The building was well alight and thick black acrid smoke was issuing from the 1st and 2nd floors. Their primary concern was to stop the spread of fire to the adjoining properties.

Within the first 30 minutes the fire was increased to a level 4 deployment which included 12 primary fire appliances, 2 aerial units, 2 rescue units, hose layer, Breathing Apparatus control, communications control unit, fire investigation unit, 4 Inspectors and 2 Commanders.

Fire Fighting Operations were greatly hindered by the fact that the tilt slab walls became unstable on the top floor, when the steel deck roof started to collapse. As such fire crews were unable to carry out an internal attack on the fire due to the threat of possible building collapse. The external attack was further complicated by windows fitted with heavy plate safety glass which required considerable effort to remove.

Fire fighting operations continued late into the next day, with the cause of the fire being determined at 12.00 pm on 31st March.

The following is an account of the fire investigation procedure.

The investigation began on the night of the fire with interviews of fire fighting crews, witnesses, employees and owners of the building.

Important information was gained from the interview with the Production Manager who was present in the building at the start of the fire. He was working on the 2nd floor when the power failed in his office. As he made his way to the main switchboard on the ground floor he noticed the lighting in that area had also failed. Upon entering the main production area on the ground floor he noticed flames issuing from the area of the switchboard room.

Investigation proceeded after the fire was contained, and an engineer consulted as to the safety of the area of investigation.

The switchboard was fixed to the concrete wall and housed in a small room of approximately 3 metres x 4 metres. This room was also used by the Production Manager as an office. The contents of this room consisted of a desk with a computer monitor and chair.

Further investigation of the switchboard area revealed the following:

The electrical switchboard was only affected by the heat and revealed no electrical short circuiting. This was confirmed by a Brigade Electrical Investigator. The south wall which abutted the service lift to the second level revealed a 'V' burn pattern indicating a low burn point near the desk. This was the lowest point of burn in the room of origin.

Excavation of this area revealed the remains of a computer monitor. Examination of the monitor revealed damage to the power input circuits. This was also confirmed by Brigade Electrical Investigator, deeming the cause of this fire

to be a short circuit to the power circuits of the computer monitor.

[Note: the construction of this wall was chipboard which was compromised early in the fire, allowing the fire to quickly spread to the upper level.]

Early predictions and witness accounts of the cause of this fire indicated a short circuit in the switchboard. Only with precise and extensive investigation and elimination of various possible ignition factors could the correct cause of the fire be determined.

Estimated Damage:
$1.5 Million

FIRE SAFETY ISSUES:

The fitting of sprinklers to the building

One of the greatest advantages of fire sprinklers is that they operate automatically and individually in the area of fire origin to prevent a fire from growing to a dangerous size undetected. One or two fire sprinkler heads control most fires in sprinklered buildings. Over 100 years of statistics indicate that a fire sprinklers' effectiveness rate in excess of 96%. In addition to this, the operation of a sprinkler head would simultaneously send an automatic alarm to the Fire Brigade, and activate localised alarms, alerting occupants.

In commercial or industrial fires approximately 60% are controlled with one sprinkler head operating, and 90% of all fires are controlled with the operation of six or fewer heads.

Along with the excellent effectiveness history of fire sprinkler systems, goes an excellent operational readiness history. Factory Mutual research has reported a failure rate of fire sprinkler heads at 1 in 16 million.

Installed Alarm System

The alarm system was fitted with passive infra red movement detectors. These alarms are not smoke detectors. If the alarm system had been fitted with a number of smoke detectors the alarm of the fire would have been raised much earlier (see table 1).

Also the alarm monitoring company must be given an instruction in writing, that when an alarm is received from an installed smoke detector, they must contact the Fire Brigade.

Generally, in a fire situation it is common for smoke to be present before there is a significant build up of heat. As the table below indicates there is a significant difference between the activation times of a smoke detector and the two types of heat/thermal detectors.

The following table indicates the predicted activation times of different detection devices, based on a computer program known as "Detact". The times shown are estimates, given that activation may vary slightly depending on room size or fire load within the room.

Table 1 - Predicted Activation Times

Detector Type	Response Time Index	Activation Time (sec)
Smoke alarm/Detector		<60
Residential sprinkler	(fast response)	50 - 190
Thermal/Heat detector	(rate of rise)	324 - 370
Thermal/Heat detector	(fixed temperature)	543 - 445

Electrical Equipment

All electrical equipment should be isolated at the power point and not left in standby mode.

An instruction should be written to explain to all employees how to isolate the building when the last person closes the business for the day.

A WOOLSHED FIRE

A Case Study, by Wal Stern.

One Thursday morning, farm workers on a property near Walgett, in north-western New South Wales saw smoke billowing upwards in the distance. Driving to the site, they found their somewhat isolated woolshed to be fully ablaze.

No firefighting was attempted, and when the scene was investigated the following day, the building was almost completely burnt. It had a wooden frame, a wooden floor, and corrugated metal walls and roof. The building was still smoking that day, and the timber almost all consumed.

The previous week, the building had been used for shearing. The shearers completed their work by Tuesday. They turned off the electricity, locked up, and set off to their next job. The fire was noted two days later.

There was no evidence of any strangers being around after Tuesday, or any evidence that vehicles had driven there. There was no evidence of vandalism, or any known reason why a fire may have occurred.

There was no electricity turned on. There was no evidence of any machinery left on, or ignitable liquids being present, or cylinders of gas noted, or materials noted present which might spontaneously combust.

A fire can occur if there is present a fuel (something to burn), oxygen, and an ignition source (a supply of heat or energy). In this instance there was present a timber structure, the woolshed, with dry timber, soaked over time with wool fat. A fire waiting to happen.

There was no shortage of oxygen (in the air). That leaves an ignition source. How did it light up?

I noticed that several timber pens near the woolshed, up to several hundred metres from the shed had been burnt, or were burning. They were all down wind from the woolshed.

I was told they had caught fire, after the farmworkers had arrived. Obviously, the fire had spread from the woolshed to these structures. There was quite a strong wind blowing in the direction from the woolshed to these timber pens, and the burning, flying embers would have been the ignition source.

When I walked around the woolshed, I noticed to my surprise areas upwind from the woolshed, at ground level, where there were burning embers. The furthest area, about 100 metres upwind from the woolshed, was smoking and exhibited burnt embers over an area of several square metres.

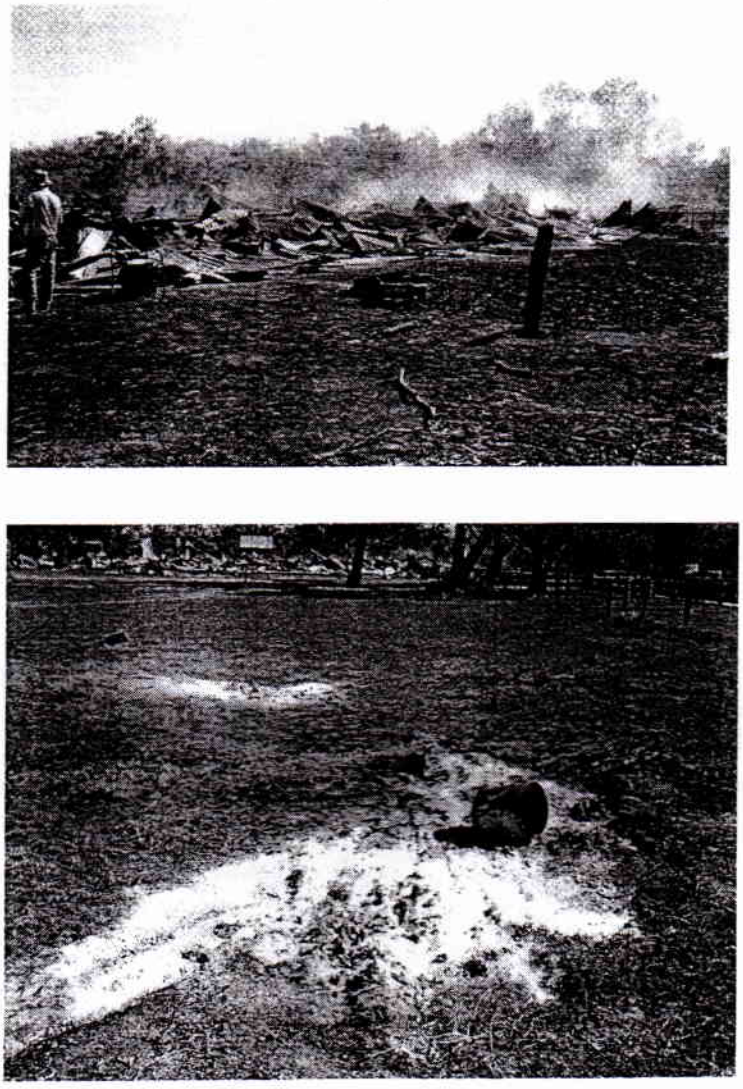
Directly between that area and the woolshed, there were several smaller burnt patches at ground level.

How could a fire be initiated two days after the shearers left? And how come there were burning embers upwind from the woolshed? There were no records indicating a change in wind direction.

An examination of the main burnt patch provided the answer. Boy Scouts know that when leaving a camp site, they need to "Bash, burn, and bury".

That's what you should do with the rubbish.

In this instance the rubbish had been collected at a site 100 metres away from the woolshed, been burnt, but definitely not well buried. Burning embers were either left uncovered, or had been blown uncovered by the wind. The wind had maintained their burning state, and then carried them to the woolshed.



Top Photo: Remains of Woolshed. Bottom Photo: Rubbish Site