FIREPOINT

IAAI

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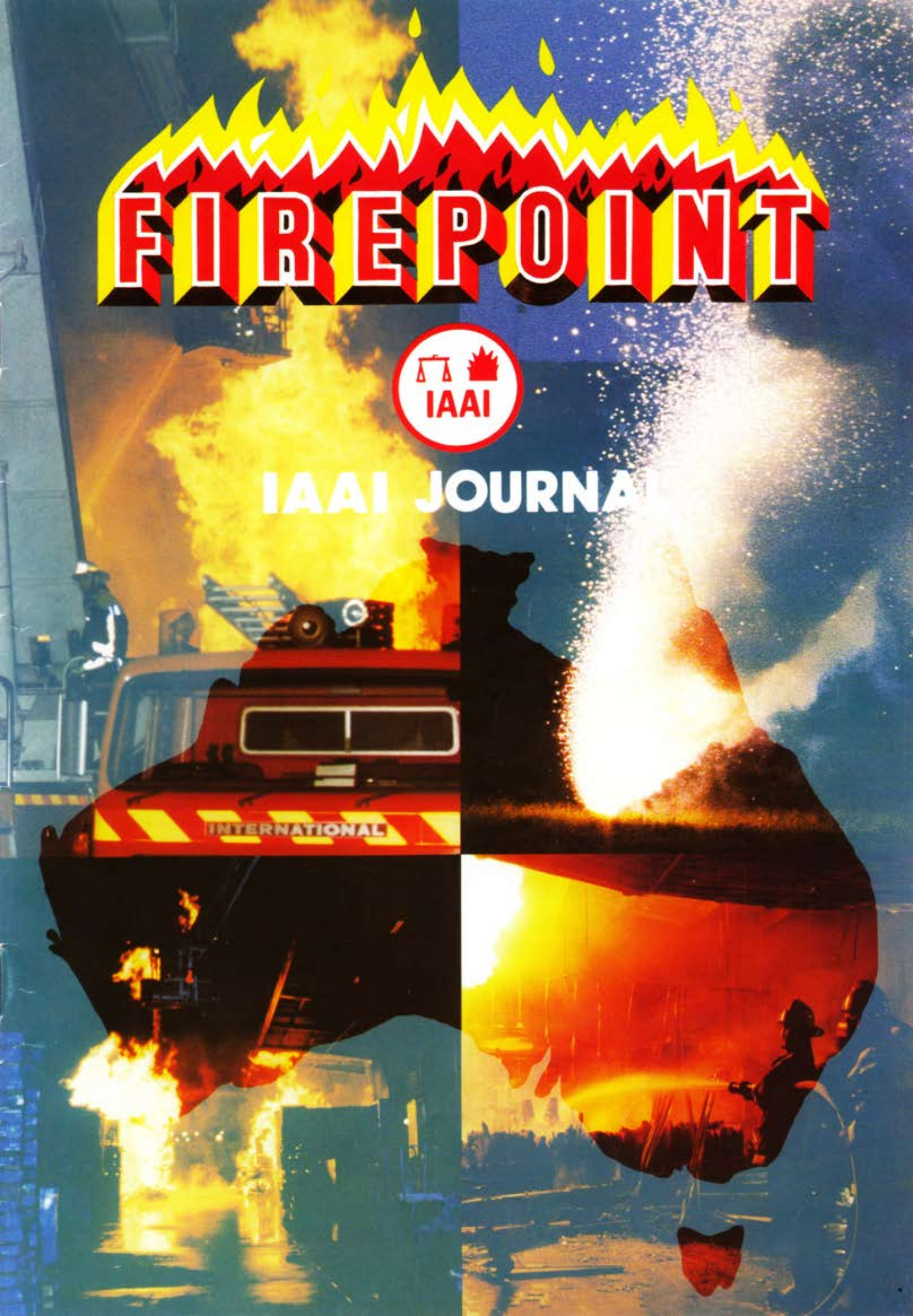

John Lehmann ≡

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FIREPOINT: IF YOU HAVEN'T PAID YOUR FEES FOR THE CURRENT YEAR, PLEASE DO SO NOW.

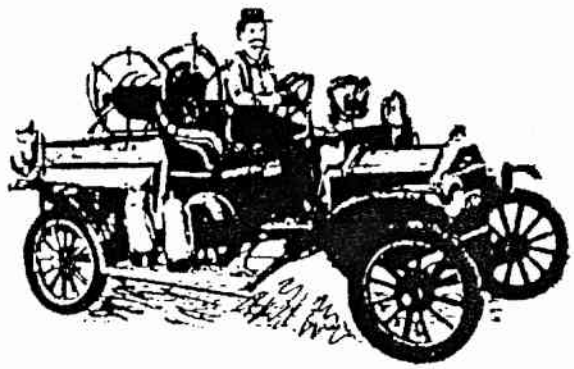
EDITORIAL

The last two months saw the Brisbane seminar on 21 July on "Rights of Access to a Fire Scene", and the Sydney Conference on "Electrical Fires... The Shocking Truth" on 18 and 19 August.

One major paper presented in Sydney is included in this issue. As well, details are provided of another important conference about to be presented, at Rural Fire Service headquarters, Sydney.

Our Associations are devoted to offering educational opportunities to the members.

Wal Stern



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PRESIDENT'S REPORT

From Paul Bailey

It is with great please that I submit to the membership the Annual President's report for my first year in the position.

I sure you will all join me when I say that this year has been an incredible eventful and indeed successful one for the Association. We have seen a steady increase in membership applications over the year with more and more people recognizing the benefits of membership of our dynamic organisation.

I stated in my first President's report published in "Firepoint" that my focus, and that of the committee, was the provision of continual education opportunities for the all the membership. To that end over the last year the committee has undertaken a number of initiatives aimed at providing these greater educational opportunities.

Firstly the committee has provided a number of education evenings free of charge to any and all members who wished to attend; and attend they did!

The committee showcased the major project currently being undertaken by the NSW Fire Brigades into residential dwellings. This projects aims to identify all the risks for both occupants and firefighters associated with new construction methods so that accurate information can be supplied to the building code authorities.

The Committee also presented the newly formed Arson Squad that is attached the Property Crime Division of the NSW Police. These Police officers are dedicated to the detection and apprehension of arsonist of whatever genre.

In addition to these education evenings the committee has been working tirelessly organising this year's annual conference. The topic of electrically based fires has generated amazing interest with delegates coming from all states of Australia and from many parts of the globe. Our speakers at this conference, who are both local and international, bring a wealth of experience that will surely add a number of arrows to any practitioner's bow.

Further to this we have entered into a partnership with the

Institution of Fire Engineers (IFE) for Continual Professional Development (CPD) points so that those delegates attending the conference who are also members of the IFE will gain valuable CPD points for there resumes.

We have also looked to further encourage the research and development of fire investigation initiatives by exploring the sponsorship of a number of honours students' projects from The University of Technology, Sydney Forensic Science Faculty and Charles Sturt University Fire Investigation students.

The committee is currently in negations with both institutions with details of sponsorship arrangements to be announced in the near future.

This year was not only my first in the President's role but the committee also elected two new Secretaries and a number of new committee members.

We thankfully received great support throughout the year from all of our more experienced committee people. The results of the hard work of a relatively inexperienced committee I believe speak for themselves. I am immensely proud and unashamedly humbled by the dedication that members of this committee have shown over this last year. I know we all look forward to continuing the work over the next term.

In closing can I say my commitment is and will always be to the membership of the NSW Association of Fire Investigators.

The committee will continue to provide the products and services that our membership requires driven by the ideas and feedback that you as members provide.

Thank you for your support and I look forward to serving the committee throughout the coming year.

Kind Regards & Stay Safe

Paul Bailey
President.

US Electrical Conference

A two-day seminar on "Electrical Fires 102" will take place November 1-3, 2005 in Twin Falls, Idaho.

There are many, very good presentations each year available covering the material of "Electrical Fires 101". But, prior to the development of this course, there was not available a course that takes off where such introductory courses finish and provides advanced information on electrical fires.

The course generally follows the electrical-fires sections of the author's IGNITION HANDBOOK, which contains the single largest collection of information on electrical fires and their investigation. The table of contents of the handbook is available at: http://www.doctorfire.com/TOC_Handbook.pdf

For registration information, please see: http://www.idfireinvestigators.org/htdocs/2005%20Conference.htm

Best regards,
Vyto Babrauskas, Ph.D.

Victorian Chapter News

MEMBERSHIP

Any members not paid fees or unsure should contact Treasurer Bob Hetherington (03) 9420 3876, as the committee will be reviewing the membership list shortly.

All members should regularly check the Website at address (www.vicfire.com) for information regarding training sessions and other information.

There has been unfortunately one planned training session cancelled due to insufficient members being able to attend.

COMMITTEE

Due to commitments of the committee members, there has been a delay with the AGM which will be held as soon as possible.

Alex Conway has indicated that after an extended period he will be stepping down as the President of the Association and has a replacement. Any members interested in joining the committee should contact a committee member.

CONGRATULATIONS

Congratulations to Bob Hetherington on being nominated and awarded the Australian Fire Service Medal in the Queens Birthday Awards for 2005. Well done, Bob.

TRAINING & MEETINGS

All members attending sessions need to book with the booking contact officers so that the committee can organise the facilities and catering.

Below is a brief summary of the Training Session held in July.

VAFI TRAINING SESSION

This session was held on the 15TH July 2005 at the MFB Training College in Abbotsford, 35 Members attended and below is a brief summary of the presentation

OPERATION THOMAS – A CASE STUDY

Presentation by Det/Sgt Ken Legat NZP Christchurch NZ

INCIDENT

This involved a fatal vehicle fire located at a remote farming property in Selwyn Council near Canterbury New Zealand.

The fatality was Jillian Thomas who was married to Kevin Harmer and who was his second wife.

On the 4th October 1999, they were at the lambing motel on the farm when the single cab Land Rover tray vehicle caught fire and Jillian was fatality injured. A flammable liquid vapour explosion was suspected.

Initially the incident was considered as an accident and the investigation of the scene and information was tailored to the

statements made by Kevin Harmer who was an influential and wealthy local identity. The incident was seen as a major local tragedy.

CASE

There were problems at the start of the investigation in the control of the scene and the extensive damage.

The experienced photographer took a lot of photos but was not asked her opinion. Due to inclement weather, covers for the scene were organised but were not large enough and also lacked on scene facilities.

Handling of exhibits were poor and not coordinated, photographed and not in right recording order.

The use of experts in this case and the testing of exhibits was not scientific or qualified.

There were many other factors to the case including plastic containers, Hamer's girlfriend, zoom lens photographs and lost exhibits.

Following 6 weeks of a second trail in July 2001 Kevin Harmer was given the guilty verdict and jailed.

LESSONS LEARNT

Lessons from this case are:

Control of the Scene from the start is vital

Body Removal v. Scene Examination

Choice of Experts

Test your Experts

Record and note all on scene exhibit handling and reports

Test of exhibits and reports

Attention to detail.

This case is now used to train New Zealand Police in fire investigation and scene control.

This a brief report to show the main points but there were many other factors that needed to be fitted into the puzzle.

Our thanks to Ken for his excellent presentation.

DID YOU KNOW?

Over 20,000 fires per year are attended in Australia by emergency services.

Last year there were 8,984 fire claims made, to a value of $1.65 billion.

GIO had 1,714 fire claims, to the value of $23.6 million

GIO had 363 electrical fire claims to the value of $4.5 million

Incidence of electrical fires in winter is double that of other seasons.

13% of total house fires occurs in July

The cause of electrical fires is component fatigue, owner misuse, design flaws or faulty installation.

Avenues of cost recovery are by way of assessor report, forensic cause and origin investigation, factual investigation findings, public information and legal opinion.

(Data from a paper delivered by Natalie Clode to the NSW AFI Conference, August, 2005).

NSW RURAL FIRE SERVICE CONFERENCE, SYDNEY

The NSW Rural Fire Service is hosting a series of two-day seminars focussing on exploring the mind and actions of the serial firesetter.

It covers the progression from child fireplay to adult arson and examines who lights fires and why. The science of arson profiling and techniques for investigative interviewing developed by the FBI will be examined.

New Australian research into serial arsonists, including bushfire arsonists, is unveiled. Implications for the future management of this problem in our society are considered.

Two seminars will be held at RFS Headquarters on 5&6 September, and 8&9 September. Cost is $190 for Day One attendance only or $300 for both days.

Contact Jen Dainer on (02) 8741 5488 or fire.investigation@rfs.nsw.gov.au for more information and registration details.

Features of this Fire Focus seminar series include:

- Presentation of material that has never been seen in Australia before
- Use of real life case studies to illustrate points
- Opportunity to participate in practical exercises
- Insight into the mind of a deliberate fire setter
- Understanding of how and why arsonists light the types of fires they do
- Examination of the prevalence and nature of pyromania
- Examination of who is lighting the Australian bush; what we know of bushfire arsonists
- Discussion of geoprofiling and what it offers arson investigators
- Insight into the FBI approach to arson profiling
- Discussion on whether arsonists burn out; examining the progression from child fireplay to adult pathological arson
- Presentation of interviewing techniques for witnesses, suspects, and others during investigations
- Discussion of whether all arsonists are repeat offenders; profiling the serial arsonist .

This is a rare opportunity for delegates to be exposed to a wide range of arson-related topics in the one seminar series. Essentially, this is a one stop shop for insight into arson and deliberate firesetting.

Former FBI analyst Timothy Huff will be presenting material to delegates; discussing the foundation of the FBI profiling program. Given the FBI is one of the world leaders in profiling, this is truly a unique opportunity.

Implications and findings from a recent Australian

study into serial arson will be discussed.

Additionally, participants will be provided with a unique insight into the FBI system of profiling serial arson.

Day One
(Open to the general public)

Rebekah Doley

Childhood fire play to adult arson: is there a progression? This first session examines the different stages of fire setting that are seen in children and adolescents and explores the notion that childhood fire setting can lead to adult arson.

The session will provide a general introduction to the deliberate firesetter, from childhood fire play through to pathological firesetting.

Parameters of arson research and a profile of a "typical" arsonist will also be considered. This session is an essential introduction to the seminar series as well as to the idiosyncrasies of what we currently know about deliberate fire setting.

Timothy Huff

Introduction to FBI Profiling of Serial Arsonists
This session introduces Timothy Huff and his work at the FBI's National Center for the Analysis of Violent Crime, Criminal Profiling Unit at the FBI Academy in Quantico, Virginia. In this session, FBI services offered to law enforcement agencies will be discussed and the hypothesised differences between serial, mass and spree arsonists explored.

The uses of criminal profiling and crime scene assessment, motive based offender analysis and characteristics of fire setters based upon an organised /disorganised classification system will be examined. This session will be integral to anyone who desires to learn more about the developments made by one of the pioneering organisations in this field.

Both Speakers
Profiling the Serial Arsonist

This session will cover links found between different motive types for arson and certain offender and offence characteristics. A general overview of the process of arson behaviour analysis (from a psychological perspective) will be given.

A discussion of the differences in characteristics and offences between one time, serial and pyromaniac arsonists will take place. This session is a unique opportunity to explore the arsonist in depth and will provide a solid foundation for anyone interested in understanding more about who lights fires and why.

Day Two (Restricted)

This day will incorporate several practical exercises for serving police officers, fire investigators, and other authorised attendees, which will

build on information presented in Day One. Audiovisual material will be presented and case studies examined.

Due to the sensitivity of the material being presented this portion of the seminar is restricted. If you are not a fire investigator or serving police officer but believe you have reason to attend this portion of the seminar please contact Jen Dainer, at the NSW Rural Fire Service, on (02) 8741 5488. The speakers will then assess if your attendance is appropriate for the material being presented, that you have a genuine need to access this information and that your attendance at the seminar will directly benefit the fire investigation community.

Timothy Huff

Behavioural analysis of arson.
This session will examine motives, characteristics and geoprofiling of serial arson offenders. Participants will have the opportunity to apply a motive-based analysis of arson to case studies presented in session. Arson analysis requirements will be considered before a practical application of the previous day's principles to real-life case studies. Finally, an in-depth analysis of the geography of arson including temporal analysis will be presented and supplemented with a practical problem from an actual serial arson case. This session will appeal to those keen to learn more about arson investigation and profiling techniques utilised by the FBI, some of which may be applicable in the Australian context.

Rebekah Doley

Arson: More of the unknown
What we know about arson is gradually expanding as interest in this field escalates. This session will examine some of the more recent conclusions of researchers in this area. Findings specific to the Australian context regarding bushfire and serial arson generally will be considered. Work in the area of screening for arson propensity will be covered and new options in the treatment for adult arsonists currently being trialled overseas will be discussed. This session is essential for those interested in keeping up to date with current trends in the arson field.

Both Speakers

Interview and interrogation.
This session focuses on the process of investigative interviewing generally and interrogation principles in particular. An FBI approach to interviewing will be examined. Practical problems will be utilised extensively to illustrate session points and techniques used by FBI investigators interviewing subjects to detect deception or establish veracity will also be reviewed.

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Presentation for the NSW Association of Fire Investigators Conference Held on 18 – 19 August 2005, in Sydney

By Arthur Donnelley

GAS FIRES

The object of this paper is to offer some guidelines to those persons investigating fires where a gas fired appliance or a gas supply may have contributed to the incident.

During the last 40 years I have been working with gas from the gas supply through to the appliance and almost everything associated with gas. Over the last 10 years I have also been involved in the investigation of fires where gas has been involved.

One thing that I have learnt is that there is a great deal of misconception about gas supplies, gas appliances and associated equipment.

This paper will, I hope, cover some basic items which should be checked at the fire scene, and the necessary follow up procedures.

1.0 THE FIRE SCENE

On the investigator's first visit to the fire scene it is very helpful if the area where the fire originated can be determined.

Sometimes the owner of occupier of the premises can relate what happened and then we know that the fire started when they were using the gas appliance. Or they smelt gas and then it went bang.

If the premises were unoccupied at the time of the fire the origin of the fire may not be quite so obvious.

Regardless of who saw what the investigator must obtain all the information necessary to complete a report acceptable to the Insurance Company, and their legal team.

1.1 Identify the appliance

Under regulations it is an offence to sell, connect gas to or use a gas fired appliance which is not approved. Approval is granted by an authorised body and a label indicating this approval must be attached to the appliance. This is usually a paper label on the outside of the appliance.

An identification plate must also be fixed to the appliance and this is usually a metal label.
This label also details the gas for which the approval has been given and often an approval number.

Most investigators can tell from looking at a domestic appliance what it does and thus fit it into a general classification, eg stove, cook top, water heater etc.

Commercial gas appliances may be a little harder to classify. Industrial appliances can be very difficult to classify.

Most commercial appliances have an identification label and all industrial appliances should have. However my experience is that very few industrial appliances have proper identification labels.

If an identification label can be found and the appliance is obviously a common type of appliance then it may be listed in "The Directory of Approved Gas Appliances and Components". This Directory may be viewed on the Australian Gas Associations web site. However some older appliances may not be on the current list as that particular appliance may have been superseded.

If it appears that an appliance is not approved then suspicions arise.

Second hand appliances may have been bought at auction, from a friend or with commercial and industrial appliances, from an earlier user.

In the absence of any formal identification on the appliance the obvious thing to do is to question the owner or the user of the appliance.

Thus the important things are;

a) **What is this appliance?**

b) **Is it approved?**

1.2 Did the gas fired appliance cause the fire?

If the gas appliance is a likely suspect then the next step is to determine what caught fire.
Was it the appliance or what was being processed in this appliance.

Considering Joe's Diner and his chip cooker

Cooking oils have an auto ignition temperature above which the oil will ignite without the need for a source of ignition. If the visible evidence suggests that the oil has ignited the fire would have been from the open top of the fryer and all above would be burnt.

This would indicate that what was being processed in the fryer caused the fire but a fault in the fryer may have caused the oil reach its auto ignition temperature.

By regulation every oil bath fryer must be fitted with a separate thermostat to prevent an over temperature condition in the oil. If the oil ignited without a source of ignition then one would suspect the over temperature control to be at fault.

If Joe is a battler he may tend to do whatever he can to keep his hot chip supply up to his customers needs and may have bridged out the over temperature device for now, meaning to fix it later.

There are very few deep fryer owners who know how to maintain their fryers so they need a competent serviceman. This can be expensive, essential but still expensive, and will all too often be deferred.

If Joe's appliance had an identification plate and is listed as being approved, but has not been maintained properly then Joe may lose his insurance cover.

This appliance fire was due to the cooking oil in the appliance, and the faulty appliance.

Considering Prangmaster Smash Repairs

They had a fire in their automotive spray painting booth. The booth was fitted with a gas fired air heating system. The heating system included the usual heat exchanger.

After the fire it was found that there was a considerable build up of over spray paint in the under floor ducts. The booth originally had a wet floor but due to the current cost of dirty

water waste disposal dry filters were installed.

Over spray paint should be filtered out of the air stream but some will get through the filters. According to advertising legends over spray paint has no solvent left in it. This I do not believe.

The fire is obviously due to heat. The only heat source is the gas burner.

The gas burner fires into a stainless steel heat exchanger and the products of combustion pass through the heat exchanger, up the flue and on to outside the building.

I have tested a 10 mm thick sample of over spray paint build up by placing the sample on a sheet metal plate and applying a gas torch to the underside of the plate. Ensuring that no flame came into contact with the sample, the plate was heated, but not to red heat. The sample ignited as the retained solvents reached their auto ignition temperature.

In this instance the heating system was only used in the winter. During the summer over spray had built up on the outside of the heat exchanger and was ignited by heat conducted through the heat exchanger. This happened on the first cold day that the heating system was used.

It was found that a sheet metal panel dividing the exhaust and air inlet ducts was rusted out and thus allowed the normal exhaust air stream to enter the inlet air system and the over spray carried in the exhaust system had built up on the outside of the heat exchanger.

If the system had been properly maintained the rust hole in the ducts would have been found and fixed.

In this example the appliance was the heating system including all the associated ducts, fans, heat exchanger and the gas burner. The appliance was identifiable and approved but not maintained. The owner had no one on site capable of assessing what maintenance was necessary. He should have sought outside help – before the fire.

This fire was due to a combination of what was being processed in the appliance and the appliance itself.

Considering Eurpoa Eatery

This place had a fairly serious fire in the commercial kitchen. The obvious suspect was the deep fryer.

An inspection of the appliance revealed what appeared to be an approved and fully functional fryer. Detailed questioning of the operator revealed that he had spilt hot cooking oil when transferring hot oil from one fryer to another.

The spilt hot oil had run down the side of the fryer and come into contact with the gas pilot flame. The fryer was not at fault. The operator made a mistake.

Common sense and experience provides a sheet metal cover over the gaps between fryers so that spillage cannot get to the gas flames below.

In this instance the drain cock for the oil pan was not sealing properly and tended to drip when in the closed position. The operator said that he was aware of the drip and that the man was due to come that day and replace the faulty drain cock.

The 2 litre container, hung on wire under the drain valve outlet suggested, being almost half full, that the drip had existed for some time.

In this case the appliance was approved but in need of some maintenance. The product in the fryer was not at a temperature above the proper operating temperature. The problem was the operator.

1.3 Type A and Type B appliances

A type A appliance is one for which there is a standard approval procedure.

A Type B appliance is one for which there is no standard approval procedure.

Type A appliances are the mass produced appliances made on a production line. The approval procedure is a detailed standard procedure applicable to that appliance.

Type B appliances are those which are the subject of a procedure which is carried out on site after installation. These are not mass produced but are usually one off custom built items.
In industrial appliances the entire piece of equipment is considered to be the appliance.

Every component of the equipment must be approved.

A gas fired oven may have as its heating system a packaged air heater. This air heater may be listed as approved in its own right. However the heat generated has to be fed into the oven to make the process work. In this case the packaged air heater is only one component of the overall system. The appliance is the overall system which can include fans, ducts, conveyors and the effects of heat on any product in the system.

Thus the fire investigator must consider the whole of a gas fired piece of equipment when considering what is approved.

1.4 Authorities

Under the current regulations the Authority is referred to as "The Technical Regulator".

In my mind this indicates a person. Other States have defined this person but in NSW it appears that this is yet to be finalized.

However, basically, if the appliance is using natural gas under the control of The Australian Gas light Company one should seek information from Agilty which is a division of AGL.

Agility is the "Net work operator" of AGL and originally controlled all natural gas installations in NSW. With the advent of competition policies other net work operators have entered the field.

Industrial appliance inspections, under the new players, seem to be the responsibility of the appliance builder.

If the appliance is fired using L P Gas then the Authority is WorkCover.

Agilty have a full and proper inspection service for industrial appliances but WorkCover do not. Thus an industrial appliance in the field using LP Gas may not be approved. This is not say that the appliance is not approvable, but that it may not be formally approved.

The Authorities rely on the Standards to dictate what is required to meet approval criteria.

The relative Standards include;

AS 3814 Code for Industrial and Commercial Gas Fired Appliances,
AS 5601 Gas Installations, and
AS 1596 Storage and Handling of LP Gas.

As is the case with all Standards the words may be misconstrued without experienced understanding.

The evaluation of what exists on site and compliance with the Standards is a specialised field and should only be undertaken by persons experienced in this field.

1.5 The fire investigator's dilemma

Once the investigator has found a suspect gas fired appliance the investigator should collect whatever information is available at the fire scene. Then choose to seek advice or not, before the demolishers move in.

2.0 GAS SUPPLY

If the problem is not the appliance it may be the gas supply.

Gas supply is either natural gas or LP Gas.

2.1 Natural gas

This product is supplied to the premises from the street gas mains. The gas pressure at the inlet of the meter will be 210 kPa in most premises. Some larger industrial plants will have up to 1100 kPa at the inlet to the gas meter.

Meter outlet pressures for domestic and commercial installations will be approximately 2-3 kPa. The smaller industrial installations may have 5 kPa or 35 kPa. Larger industry can have 100 kPa.

The street gas main pressure is reduced at the gas meter inlet and is the fed to the appliances through the consumer piping system.

2.2 LP Gas

The consumer has cylinders or tanks on site to store at least two weeks supply of LP Gas.

This amount of gas stored on site can have serious effects on a fire situation.

There is no gas meter as the customer pays for gas delivered by cylinder exchange or by metered hose from a road tanker.

Gas line pressures on the premises are 2.75 kPa for domestic and commercial installations.

Many industrial installations have a bulk storage tank with a pipeline form the tank to the building with a second stage regulator fitted outside the building. This gas line operates at 140 kPa. The outlet pressure of the second stage regulator is 2.75 kPa.

2.3 Licensed Gasfitters

Both natural gas and LP Gas pipe installations must be carried out by suitably licensed persons.

A person licensed for natural gas has GASFITTER marked on his license.

A person licensed for LP Gas has LP GASFITTER or ADVANCED LP GASFITTER marked on his license.

An LP GASFITTER can work on installations up to 140 kPa pressure but cannot handle LP Gas in the liquid phase.

An ADVANCED LP GASFITTER can work on any LP Gas installation except motor vehicle installations, which require a separate license.

For both natural and LP Gas the licensed gasfitter must issue a certificate of compliance for the work carried out.

In LP Gas installations the licensee must also fit a metal compliance plate close to the gas cylinder or bulk tank.

If an LP Gas installation is altered in any way the original compliance plate must be removed and a new compliance plate fitted. The licensee whose license number appears on the compliance plate is responsible for the installation being in compliance with the regulations current at the time the plate was fitted.

When investigating a fire incident involving LP Gas the compliance plate should always be located and its details recorded.

2.4 Altered installations

The LP Gas compliance plate lists the type and number of gas storage vessels on site and the appliances connected at the time of the original installation.

If the original installation was served by 2 x 45 kg exchange gas cylinders but there is now a single 90 kg in situ fill cylinder on the site the compliance plate should have been changed to reflect this change. Unfortunately some gas suppliers are making this change and not updating the compliance plate.

The LP Gas compliance plate also lists the appliances connected at the time of the original installation. All to often an additional appliance is added and the compliance plate is not changed.

When a new compliance plate is fitted after an alteration the LP Gas licensee is obliged to inspect the entire installation, and carry out a leak test. Again, unfortunately not all licensees do this.

One of the problems with LP Gas in a domestic situation is the parsimonious DIY expert who fiddles with the installation.

In one instance a DIY person removed an appliance and turned off the gas valve supplying gas to this appliance. He did not plug the redundant valve. Later this valve was inadvertently turned on with spectacular results and lots of legal work in helping the injured parties.

The license number on a compliance plate can be checked via the Office of Fair Trading web site. When questioning the licensee do not be surprised if the compliance plate details do not match the licensee's records.

2.5 Loss of containment (Translation – leak)

The result of a gas leak is an escape of unburnt gas.

If leaking gas ignites immediately, a fire will occur. If leaking gas does not ignite immediately, the result may well be an explosion.

Natural gas is lighter than air while LP Gas is heavier than air. A natural gas leak will readily rise while LP Gas tends to stay at floor level. Both gases have an introduced odour but some people cannot detect the smell.

Some injured parties have been standing in ankle deep LP Gas vapour and not noticed the smell.

In larger LP Gas installations a gas leak can develop when the plant is shut down. These installations may have a bulk storage tank with a first stage regulator at the vapour outlet of the gas tank. The outlet pressure of this regulator is usually 140 kPa.

If this first stage regulator is not sealing properly the pressure downstream of this regulator may

increase. If the downstream gas is being used this pressure increase may be used up by the appliances. When the appliances are shut down over night or at a weekend the downstream gas line pressure will build up to the point where some component downstream fails. Thus a very large amount of gas can escape inside the building.

If the gas which leaked out eventually finds an ignition source then an explosion can be the result. Such an explosion can be catastrophic.

One wonders why there is all too often no device fitted in the gas line to prevent this happening. Particularly, when such a device is required by regulation (AS 5601 4.2.1).

The preventive device is called "***over pressure protection***".

The identification of the regulators on an LP Gas installations is a very important factor in final evaluation of the cause of a fire where "loss of containment" has occurred.

3.0 ELECTRICAL SYSTEMS

Many modern Type A gas appliances have electrical devices in the control system of the appliance.

Almost all Type B appliances will be dependant on electrics for safety and control.

Where a Type B appliance is involved in a fire the investigator should endeavour to obtain any operation or maintenance manuals from the staff on the fire scene site.

If possible any devices associated with the safety and control of an appliance should be examined before demolition takes place. One all too common factor is that the air flow proving pressure switch has been bridged out.

It is also wise to determine who on site, or which off site contractor was responsible for any electrical maintenance work on the appliance.

4.0 SUMMARY

A fire investigator is one of the first people on the scene after the fire. This investigator needs a wide knowledge of many fields to gather the necessary forensic evidence to begin the investigation and more to finalise the investigation. I hope these notes will assist fire investigators in gathering the necessary evidence and determining when to seek assistance.

The foregoing notes are simply notes. After many years in the gas industry I can assure the reader that gas installations and gas appliances are complex fields. I have yet to find a text book for industrial gas appliances. There are to my knowledge no training courses at TAFE or the normal Universities.

However I have found that the only institution offering higher education in this field is **UHK**. (University of Hard Knocks). The fees are horrendous, the hours continuous and graduation comes after a lifetime.

Arthur Donnelley started his working life as an apprentice plumber in his family firm. He has built special purpose industrial gas fired appliances, and offered turnkey deals on gas installations. With the advent of natural gas, his firm became involved in LPG, landfill gas and cryogenics. They even took on special effects for movies and television.

After selling his company he tried semi-retirement but after one week he was bored, and decided to carry on.

MURDER OF FOUR CANADIAN MOUNTED POLICE

Dan Little
Ontario Chapter, IAAI

On March 3, 2005, four members of the Royal Canadian Mounted Police (RCMP) in Alberta Canada, were killed.

They were ambushed and killed by a home owner as they began an investigation into a suspected marijuana grow operation.

Information about these four brave officers can be found at the following site. I urge you to read about them. The youngest officer was 25, the oldest was 32.

www.rcmp-grc.gc.ca

The death of these four officers has had a profound impact on our Ontario Chapter of IAAI and our country. Over the past two years, our IAAI Ontario Chapter has hosted seminars, and worked closely with members of law enforcement and the fire service.

We worked together in an attempt to understand the complexities that drug labs present to all investigators in the public and private sector. We are hopeful, but not optimistic, that our government will realize the problems that these labs. create, and enact stricter criminal sentences for those who are involved in the drug business.

I am writing this message to you for two reasons. First, the sacrifices made by these four young officers must be recognized outside of Canada.

I know by sending this message to my committee contacts in the USA, Israel, the UK , South Africa, Australia and New Zealand that the "word" about marijuana grow labs will get out and be heard.

The world needs to be reminded, that this criminal activity involves much more than "a joint".

It is a business whose product and distribution channels are controlled by organized criminal groups.

Our International Association has global reach. I would ask that you help us pay tribute to these officers by doing what you can to get this message out.

The memorial service for the fallen officers was televised nationally. Our Prime Minister, our Governor General and other dignitaries spoke of the officers bravery both in their careers and during this tragic event.

One friend or family member of each of the three officers, and the twin brother of the fourth fallen officer, taught us about who these men were out of their uniforms. All were respected and admired for their contributions to friends, family and their community.

When the testimonials for each officer was read, I don't think there was a dry eye anywhere.

There were many officers present in full dress uniforms from across Canada, the USA and some foreign countries.

DAUBERT REVISTED: *BITLER v. A.O. SMITH, CORP.*

In the twelve (12) years since the U.S. Supreme Court's landmark decision in *Daubert v. Merrill-Dow*, courts have directed intense scrutiny at the methodologies and procedures of expert witnesses in all types of cases. The emphasis on "reliability" under the *Daubert* decision has led to a more restrictive process for judging the admissibility of expert testimony. Although the very premise of *Daubert* was that the Federal Rules of Evidence were intended to facilitate the admission of expert testimony at trial, this new evidentiary standard has made the admissibility of expert testimony far more difficult than ever before.

A recent decision from the United State Court of Appeals for the Tenth Circuit may signal a new direction for the courts in evaluating expert testimony. In *Bitler v. A.O. Smith, Corp.*, 10th Cir., No. 02-1527 (December 6, 2004) a *Daubert* challenge was raised in a gas explosion case.

Mr. Bitler was severely burned when a gas water heater exploded in his basement. The gas service supply line was an unsupported flexible copper tubing along the ceiling joist in the basement. A T-fitting supplied gas to the water heater and a nearby space heater.

In the investigation of the accident, it was revealed that there were leaks in the gas supply line at the T-fitting and the space heater, as well as the safety valve seat of the water heater. A fire investigator hired by an insurance company determined the water heater was the source of the explosion.

An investigator hired by the Bitler family determined the explosion was caused by copper sulfide contamination on the safety valve seat of the water heater. Bitler sued the manufacturer of the water heater and the gas company which had installed the water heater and the gas piping.

The Bitlers' expert identified copper sulfide particles and grease on the safety valve seat which had caused a leak allowing gas to escape. The expert testified that the valve seat had been turned to the "off" position after the explosion and was damaged. It could not be adequately tested afterward to verify the theory of the explosion.

Instead, the expert presented his theory through the "elimination method" often employed in fire and explosion investigations to determine the cause of an incident by eliminating all other potential causes. He noted that there had been copper sulfide contamination to the valve seat which would have allowed gas to escape. He eliminated any other source of a gas leak in the immediate area which could have caused the explosion. Using deductive reasoning through the "elimination method", he concluded the explosion had been

caused by the copper sulfide contamination at the valve seat.

Experts hired by the manufacturer and the gas company asserted this theory was not scientifically valid and did not satisfy the reliability criteria under *Daubert*. The primary point of contention was that the theory could not be validated by testing the valve seat after the explosion incident.

Under the Scientific Method outlined in NFPA 921 and embraced by the U.S. Supreme Court in *Daubert*, a hypothesis or theory must be tested using empirical data in order to validate the theory as reliable.

The trial court excluded the testimony of the expert for the Bitlers based upon this point. On appeal to the 10th Circuit, this decision was overturned. The appellate court ruled that an expert does not have to prove his theory is "undisputedly correct" or universally accepted, despite the language in the *Daubert* decision requiring scientific verification and employing "general acceptance" as a measure of reliability.

Instead, the court held that an expert must only show that his methodology is scientifically sound and his conclusion is based upon facts which can be reasonably established from the evidence. The determination of "relevance and reliability" to admit an expert's testimony can be made from an examination of the relationship between the methodology, the conclusions and the facts considered by the expert.

While the United States Supreme Court in the *Kumho v. Carmichael* decision had ruled that an expert cannot validate his theory and conclusions based upon the "ipse dixit" of his own opinions, personal experience and professional training will be considered in determining whether a conclusion drawn from deductive reasoning is valid and reliable. The court noted that the concepts of testing and peer review outlined in the *Daubert* decision may not be appropriate when examining a case where deductive reasoning has been employed.

Demonstrating extensive experience, training, proper methodology and deductive reasoning to reach a conclusion will be considered "scientifically valid". The court observed that testing could not be done with the valve seat because of the damage caused by turning it to the "off" position after the explosion. The inability to conduct an actual test was not fatal to the methodology of the expert because of the unique nature of the explosion incident at issue.

The testing of a hypothesis is aimed at "theories which explain causal relations among regularly occurring natural phenomena". The explosion in this case was a "one-time occurrence" which made testing both unnecessary and inappropriate. The court analogized the process to the use of a "differential diagnosis" in medicine when

symptoms suggests several potential causes of a health problem.

Considering those potential causes and eliminating them through examination and/or testing is a scientifically sound methodology for arriving at the ultimate diagnosis. In fire and explosion cases, the same approach can be employed as a reliable methodology under the standards of *Daubert*. The court described the process as "reasoning to the best inference".

In this case, the expert reliably proved that contamination by copper sulfide particles could cause a leak. He proved there had been contamination to the valve seat. The underlying theory was established to the satisfaction of the court. It then become a question of whether the theoretical potential of a leak had actually occurred in this case.

The expert reliably proved through inference and deductive reasoning that this was the only credible explanation for the explosion incident. "Physical investigation, professional experience and technical knowledge" were recognized by the court as the appropriate means for proving the theory.

The *Bitler* case is significant in several respects. First, it is a decided departure from the strict "testing and validation" requirements which have been imposed in other cases. The expert was allowed to use subjective elements in the investigation of the explosion incident. The court held that the entire process does not have to be purely objective and scientifically provable. Instead, a scientifically sound foundation for the theory with reliable processes used to confirm the theory will be considered as reliable under the *Daubert* standards.

In sanctioning this process, the court recognized the unique challenges of analyzing and reconstructing a fire or explosion incident. In many of those cases, it will not be possible to recover all of the physical evidence and test it to prove the theory. The *Bitler* decision will allow an investigator to use a subjective process based upon sound scientific reasoning to reach the ultimate conclusion of the fire or explosion incident's cause.

At least in the 10th Circuit, expert testimony in fire and explosion cases will be more readily admissible. The case precedent of this decision will likely lead to similar rulings in other circuits across the country. It appears that we may have reached the "high-water mark" of *Daubert* challenges to the findings of expert witnesses and the tide may have begun to turn.

While only time will tell if this truly represents a new trend in the evaluation of expert testimony, it is an encouraging sign that courts will be more receptive to the processes of fire and explosion investigations in future cases.