# FIREPOINT

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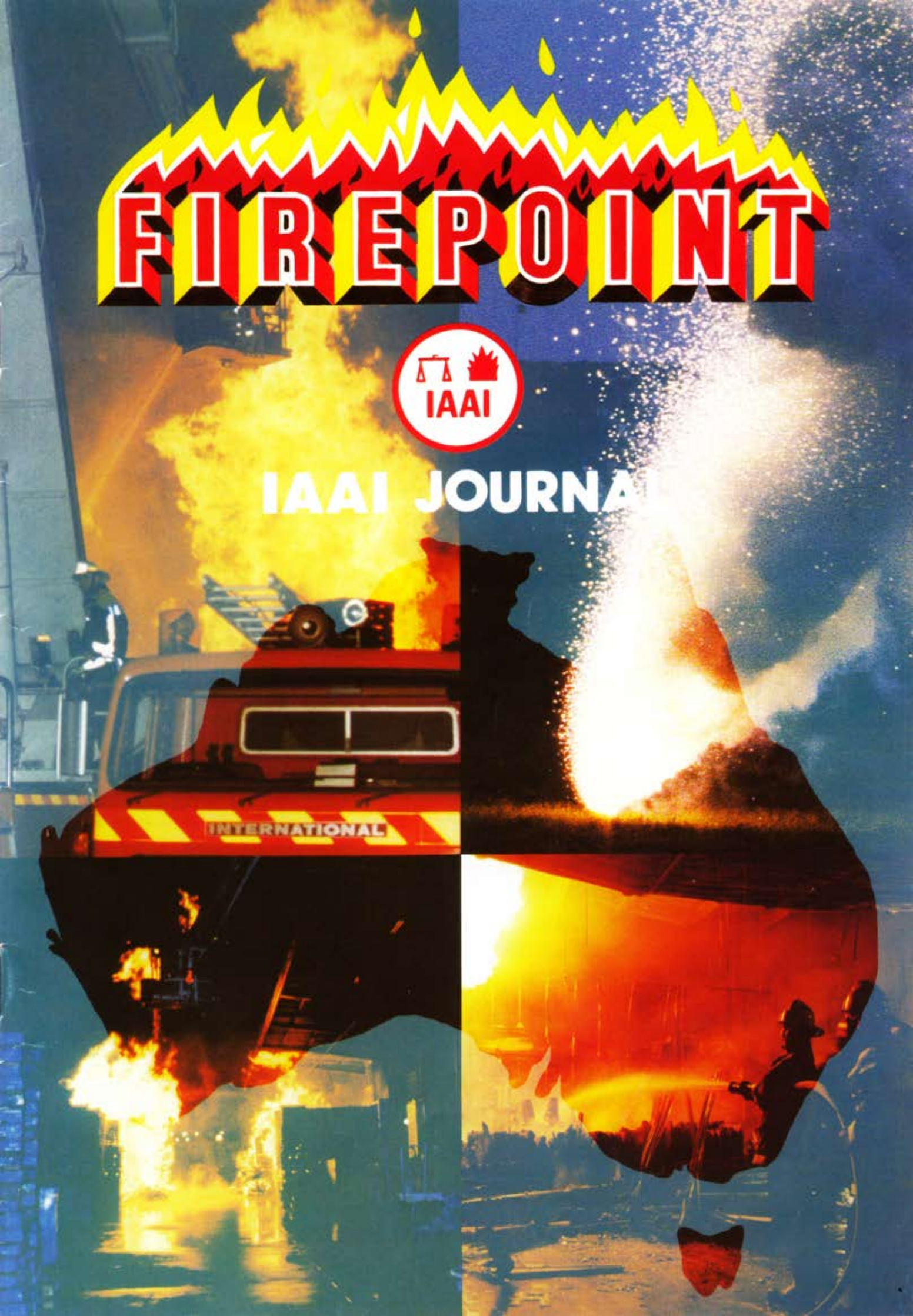

December, 1996 Volume 7, No. 4

# Firepoint

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## EDITORIAL

*One of the conclusive recommendations coming fom the "Firepoint" questionnaire sent out to NSW members with the last issue was that editorials should not be too long. Hear, hear! I hate long editorials. I rarely read them past the first paragraph.*

*Allow me just to wish each and every one of you all the best for the holiday season, and a bright and happy new year. And let me know your grizzles about the magazine.*

*Wal Stern*



## CONTENTS

Vol. 7, No. 4, December, 1996

# NEW SOUTH WALES NEWS

## NSW PRESIDENT'S REPORT

*(From NSW AFI President, Ross Blowers).*

Welcome to the final edition of Firepoint for 1996. The Firepoint magazine has been and will continue to be an important conduit for transfer of information between the Australian Chapters of the IAAI and their respective Memberships. A great deal of thanks must go to Wal Stern for dedication and professionalism in the production of OUR magazine.

In the last issue of Firepoint two questionnaires were dispatched to NSW members, with a view to capturing the mood and views of the Membership concerning the Firepoint Magazine and Content of Chapter Conferences. A full briefing of the responses will be discussed at the November 1996 Executive meeting and will then be tabled in the first edition of the 1997 Firepoint magazine.

A common thread of responses from both questionnaires was a need for more articles or seminars on Case Law, Case Studies and on Fire Investigation Techniques.

Several respondents were particularly interested in learning more about Arson Immunity Legislation.

Information from IAAI (USA) President Alan Clark in respect of the provisions and implications of the NFPA 921 guidelines suggests that a concerted education and training program is underway.

In early October 1996 I attended the Victorian Chapter of IAAI Conference on "Dealing with Disaster". Adrian Edwards (President) and his Executive produced an excellent conference agenda with exceptionally good speakers. Some extremely interesting issues were raised and discussed.

After the Victorian Conference a meeting between the Victorian and NSW Chapters Executive took place, discussing various issues such as support from the International, conference topic and speaker sharing, reasons as to why NSW changed its name to NSW AFI, consolidation and sharing resources and closer relationships between the Australian Chapters, to name but a few.

It was decided that this type and style of meeting should be held at least annually to assist in co-ordination and direction of resources as well as assisting in education and training programs.

The NSW AFI Executive would like to see as many members and guests as possible attend our NSW Christmas function to be held at the Cruising Yacht Club in early December, 1996. It will be an occasion where we can share experiences and knowledge and recount experiences over the preceding twelve months.

On behalf of the NSW AFI Executive I would like to wish all Members and Friends a very happy and gracious Christmas and a prosperous New Year for 1997.

**Ross Blowers**
**President**
**NSW AFI**

## NSW FIU REPORT

*(Compiled by Roger Bucholtz, NSW Fire Brigade Fire Investigation Unit). Roger, currently Past-President of NSW AFI, has kindly agreed to take over from Alan Easy in compiling this regular report.*

Firefighters throughout the State have been asked to be on the alert for fires which may be attributed to a product known as Therapeutic Grain Bags.

A recent warning has been issued by the South Australian Metropolitan Fire Service and the New South Wales Fire Brigades regarding the correct use of the Therapeutic Wheat Packs.

Advice received by the NSW Fire Brigades is supported by research conducted by the South Australian Metropolitan Fire Service. It indicates that the bags may ignite if used incorrectly and heating instructions supplied by the manufacturers are not adhered to.

These wheat bags or pillows, usually measuring thirty centimetres by fifteen centimetres, although they may be made to any size, are contained within an outer sleeve, usually made of velvet material or light

calico or polyester cotton, and are filled with wheat or other similar grains. This forms a malleable bag which when heated in a microwave oven, fits quite snugly onto most body joints and parts.

There is evidence of fires occurring when these bags have been heated and used as hot water bottles to warm a bed. Other instances have been reported where the bags have been discarded after they were removed, smouldering from the microwave oven.

Tests that were carried out by the South Australian Metropolitan Fire Service suggest that the bags deteriorate with continued use and that spontaneous heating can occur. The likelyhood of spontaneous heating is enhanced by surrounding the bag with heat contained blankets or an eider down quilt.

The NSW Fire Brigades recommends that the products be used with the following guidelines :

- Do not overheat - maximum of three minutes.
- Follow manufacturer's instructions.
- Do not dispose of the instructions if they are not attached to the pack.
- Use the wheat bags only as a heat pack for direct application onto the body.
- **Do not use them as bed warmers.**
- Do not reheat the wheat bag until it has completely cooled, which may be more than two hours after the initial heating.
- Do not leave the microwave oven unattended.
- Watch for signs of overuse, an overcooked odour or a smell of burning, or in extreme cases smoke and/or charring emanating from the bag.
- Discard the wheat bag if you observe any problems with it.
- Do not store, until completely cold, leave to cool on a noncombustible surface. eg kitchen sink.

# VICTORIAN NEWS

*( A message from the desk of the Victorian IAAI President, Adrian Edwards)*

As another year draws to a close, I feel we can look back over the preceding twelve months and feel justifiably pleased with the success of events programmed by the Chapter.

This year saw dinner meetings featuring presentations on topics including "Photographs at the Fire Scene" and an informal insight into Australia Post operations. In addition the Chapter presented its first breakfast meeting, which was very well attended.

Training nights for our country members continued this year with presentations by committee members at Morwell and Mooroopna. Both these nights attracted large audiences and demonstrated the strong demand for these nights to continue.

In October, following many months of planning and organising, our seminar featuring guest presenters from Los Angeles and Houston was conducted at Chaucers Canterbury Receptions. Unfortunately, many of our Insurance Industry membership chose not to support this seminar. To the sceptics, I can only reiterate the comments of the 80 plus attendees that the seminar proved to be most informative and entertaining.

Previously our year has concluded with a golf day and barbecue lunch. Unfortunately, due to ongoing court commitments involving a number of committee members I thought it best to delay the day till March, 1997. Members will be advised of the date and venue early in the year.

In concluding, may I take this opportunity on behalf of the committee to wish all members throughout Australia a safe and happy Christmas. We look forward to a successful association in 1997.

**Adrian Edwards**
**President**

*Editor's Note:*
*I congratulate Victoria on a fine year. Membership subscriptions to Firepoint grew from March (140) to December (216), and the range of meetings (dinner, breakfast, city and country) provided a most valuable educational input.*

***SEMINAR 1996***

*DEALING WITH DISASTER*

On Wednesday 2nd & Thursday 3rd October the Victorian Chapter presented a Seminar providing a unique opportunity for members and others to access current and future approaches in the handling of disasters. The subjects dealt with included floods, earthquakes, major motor vehicle accidents, victim identification, riots and the WACO Texas incident from many different perspectives.

The main theme throughout was how disasters effect people who become victims and that inter agency and agency procedures should include a plan A and a plan B.

Disaster management and the lessons learnt from each disaster provides the background and the planning strategies which everyone needs to consider before it happens.

The Chapter Committee wishes to extend their appreciation to those who attended, especially those from interstate, our sponsors for the seminar being FAI, Commercial Union, INS and Forensic Consulting Services,

and finally to all our presenters particularly our overseas presenters, John Kolman and Paul Gray.

On the Wednesday night a conference dinner was held to allow members and presenters to mingle, enjoy and to laugh along with the guest speakers. Our thanks to Chaucers for their facilities and co-operation for both the Seminar and Dinner.

*NIGHT AT SHEPPARTON*

The Chapter organised a presentation of the Roles of Investigative Bodies at Mooroopna on the 24th September. This night was well attended and proved to be a successful night for all those involved. Our thanks to Allan Rankin for his assistance.

*MEMBERSHIP*

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

Richard Atkins
Warren Davis
John East
Andrew Fyfe
Roland Hill
Alex Pratt
Michael Rossiter
Rodney Sherrin
Brooke Sanford
Peter Redman
Peter Alford
John Kincade
Michael Marrs
Tasmania Fire Service Library
CFA Library ( Fiskville )

Membership has been steadily growing, but those who have not paid fees have been taken off the mailing list. If anyone has any enquiries regarding membership contact the Secretary.

*CHAPTERS MEET*

Communication between Chapters has been very limited in the past but following on from the Seminar at Chaucers an inaugural meeting of Victorian and New South Wales Chapters was held. Principally the discussions were around each Chapter's activities, the sharing of resources and the scheduling of major events. It was good to put faces to names; this meeting gave both Chapters food for thought for the future.

*PROGRAM OF EVENTS 1997*

Due to pressure of commitments the Annual Golf Day Tournament has been postponed to March, 1997. This gives the golfers more time to practice.

*Late February 1997*
Breakfast meeting planned

*March 1997*
Golf Day

*May 1997*
Dinner Meeting

All members will be notified by mail of functions. It is imperative that members reply so that the appropriate arrangements can be made.

## Letters to the Editor.

The Editor
Firepoint

Dear Wal

Oh, how it filled my heart with joy to read Terry Casey's letter in the September issue. I only hope that the debate can continue and not die a silent death

Paul Bahr
Fire Investigation Section
SAPOL

*Editor's Note:*

*Paul, the debate will go on, I guarantee you. Another article on ethics, downloaded from the Internet, is planned for the next issue of Firepoint.*

## OPERATION BRIGHT SPARK:
### "The Findings"

Operation Bright Spark was the code name given to the three day seminar conducted at Bellowrie, Brisbane from 22-24 July, 1996. The seminar offered practical and theoretical aspects of the investigation into electrical causes of fires.

One day was dedicated to the presentation of theory papers, with two days devoted to practical demonstrations. These live displays involved several single and multiple room scenarios, culminating in the total involvement of the modern brick veneer dwelling on the final day.

Over 100 participants were given the opportunity to examine the pre-fire situation, witness the fire and fire suppression. Within 30 minutes of each fire. participants then viewed the aftermath, with consideration to investigation requirements.

This joint venture by the Queensland Association of Fire Investigators (IAAI Chapter 59), Department of Mines and Energy, Queensland Police Service and Queensland Fire Service has been commended for the success of the project.

Inquiries into the findings and outcomes of Operation Bright Spark have been received from the Fire Industry, Electrical Manufacturers, Risk Management, Insurance and Legal sectors. The Building Industry and the Fire Protection Industry have recently also indicated a special interest.

The initial intent of Operation Bright Spark was focused on the involvement of electricity in the cause of a fire in a modern dwelling and the investigation considerations. Areas such as fire and smoke development and the subsequent fire damage to the premises was also of major significance.

Operation Bright Spark also allowed for the testing under aggressive fire conditions of Residential and Domestic Sprinkler Systems, Electrical Safety devices, Heat Resistant Electrical Cabling and the use of hydrocarbon refrigerant gases in both refrigerators and air conditioning units.

The action of this project was captured on film, both movie and still. In fact over 30 hours of live footage and more than 100 still shots were recorded. In September of this year the Queensland Association of Fire Investigators Inc. released and launched the documentary video "Operation Bright Spark." This video provides good coverage of the two day practical demonstrations and a summary of the results of this project.

After the completion of the project and the review of the video footage, information collected and the inquiries made from a range of industries, key Operation bright Spark design committee members are to stay in position so as to review and document all findings.

This team will consist of Mr. Terry Casey, President of the Queensland Association of Fire Investigators, and Director of Forensic services Australia, Sergeant Geoff Nufer of the Queensland Police Scientific Unit, Mr. Alan Faulks of the department of Mines and Energy Appliance Approval Section, and District Officer Tom Dawson, the Queensland Fire service Fire Investigation Unit Co-ordinator.

It is the intent of this group to present a summary of their findings in the following editions of Firepoint.

**Tom Dawson**

# FIRE CAUSED BY HEAT FROM BUILT-IN HALOGEN SPOTS

*(This case study, submitted by Mitch Parrish of Zurich Australia Ltd, comes from Issue 96/1 of "Schaden Spiegel", a publication of the Munich Reinsurance Company).*

Low-voltage halogen lighting is becoming increasingly popular at home, in the office, and on the shop floor. With the good value for money offered by Do It Yourself stores and the low operating voltages required, it is a temptation for the layman to buy a halogen system and install it himself. In doing so, however, he often overlooks the particular fire hazards inherent in this new technology.

**The Loss Event**

One evening a man saw flames on the roof of a neighbouring house. He gave the alarm at once and the fire brigade arrived at the scene so quickly that they were able to confine the fire to the roof and ceiling structure.

The cupola roof of this new one-storey building had a steel plate covering. The loadbearing roof structure was made of wooden trusses. The underside of the roof also formed the underside of the ceiling and was faced with gypsum plasterboard in which openings had been made to hold the halogen spotlighting.

The cavity behind the gypsum plasterboard facing was filled with a 20 cm thick layer of combustible thermal insulation. This was made of waste-paper flock which had been blown into the cavity after the halogen spots were installed. Above the insulating layer there was a continuous lagging of wooden boards about 2 cm thick. Above this there was a ventilation cavity of about 10 cm and then the rafters with the sheet plate covering.

During the subsequent investigation into the cause of the fire, it was found that the combustible thermal insulation in the cavity had ignited due to the build-up of heat from the halogen spots.

There was no safety gap between the spots and the loose-fill insulation, and the aluminium foil that had been wound around the back of the spots could not prevent heat being transmitted onto the combustible material.

Incidentally there had also been an infringement of the building regulations in that the openings in the ceiling did not have the fire protection covers required for the fire resistance class of gypsum plasterboard.

**Conclusions**

To avoid fire hazards, it is essential that the building regulations and the manufacturers' installation instructions are observed.

Low-voltage halogen lighting systems should only be installed by experts in compliance with the safety regulations.

**Anton Grasserbauer, Graz**

Any inquiries regarding Operation Bright Spark or the purchase of the documentary video should be directed to:

Queensland Association of Fire Investigators
P.O. Box 5173
Alexandra Hills
QLD 4161

Phone: 07 3822 4241
Fax: 07 3822 4246

# SHORT CUTS CAN BE DANGEROUS

*Craig W. Brittingham*
*Chief Fire Marsal*
*Medford, New Jersey*

*(reprinted from the September 1996 edition of Fire & Arson Investigator)*

The intent of this article is not to put the blame on contractors, building inspectors or other responsible parties. Rather, the intent of this article is to inform you that mistakes can and are being made that are dangerous and could be fatal..

Contractors and heating companies are making changes that differ from manufacturers specifications, changes they feel may be within the tolerance of safety. In essence, they are putting their customers in great danger.

In January of 1994, in Medford Township, New Jersey this possible life threatening incident occurred. The winter of 1994 was extremely cold and nasty. Snow, rain, ice, sleet and below zero temperatures assailed us from December through March. Heaters were constantly running to keep warm through the winter season.

At approximately 8:25 a.m. on January 9, 1994, the temperature was 25° F. Medford Township's Fire Departmentsresponded to a reported dwelling fire.

The firefighters, in the first engine to arrive, reported medium to heavy smoke coming from the rear of the dwelling. They located the fire and attacked with a 1 1/ 2" line. The bulk of the fire was located in the crawl space under the rear of the dwelling. The occupant of the building was outside.

The occupant stated that approximately one hour prior to the fire, she awoke and smelled smoke. She assumed it was someone's wood stove or fireplace in the area, and not seeing any smoke, she felt comfortable going back to bed and fell asleep. Around 8:10 a.m. she was awakened by heavy smoke throughout the house.

She proceeded to the kitchen to call 911 and observed smoke coming from the utility/heating room. The occupant placed her call and left the house. The fire was confined to an area approximately 4' x 4'. The damage to her house included floor joists, 2" x 4" wall studs, and 1/4" under lament and 1/2" plywood. There was extensive damage to the 2" x 10" floor joists, and damage to the sill plate at the foundation.

There was a dryer vent that ran through this area and was vented to the outside of the building. There was electric wiring in this area, but all of the outlets and wires were below the damaged area of the fire.

Some of the wires were melted, but the damage was consistent with external heat damage. The occupant was asked if the dryer had been used that morning, she stated that it had not been used since the prior evening.

The area was closely checked for an accumulation of lint, due to the dryer vent running under this area. There was no build up in the area or in the general vicinity. Since the dryer was installed several years prior, if there was a leak, lint would have been found in the entire area.

There was a dry-based, oil-fired boiler placed on patio blocks on the plywood flooring in the utility/heating room. The blocks were intact but the plywood under them was almost completely consumed.

After examining this area the fire appeared to have burned from the top down. The plywood that was left under the boiler was extremely brittle and in very fine pieces. This would be consistent with a slow breakdown of the wood and indicates a slow burning fire. On the other hand, the char on the 2" x 4 and 2" x 10" was consistent with a more rapid burning fire.

After checking with the manufacturer of the boiler, it was determined that they required a shield to be installed between the boiler and a combustible floor. This required shield has a four inch airspace between the boiler and the combustible surface.

In conversations, with heating contractors, placing patio blocks under a heater is not unusual. After examining all the other clearances, it appeared that the boiler was installed within these tolerances. The boiler was rated at 98,000 BTU/hr. The minimum clearance to combustibles is: front requires 48", sides 18", rear 18", above or top 18" and vent connection pipe 18".

After carefully examining all the evidence, it was determined that the boiler *was* installed improperly. Placing the boiler on patio blocks instead of using the required mounting shield, in the manufacturer's specifications, caused pyrolysis, (a chemical reaction or oxidation of material that lowers the ignition point of wood).

This boiler was installed in August of 1990. The patio blocks, that were used as a shield, had spaces between each block from 1/8" to 1/4". These blocks increased the heat transfer from the boiler to the wood under the boiler.

Over a period of four years, the wood was slowly breaking down to the point where the heat from the bottom of the boiler was enough to ignite the under lament and plywood.

Possibly this type of installation may not have had any problems for 10 to 15 years depending on the size of the room, the amount of air exchange in the area, and the degree of temperature in the region. It is this investigator's opinion that this type of installation is a time bomb just waiting to go off. The occupant of the house was lucky, the next person may not be. We should all keep our eyes open and if an installation calls for a safety device, whatever the product, the manufacturer has a reason for this device. Short cuts can be deadly.

*Fire and Arson Investigator's Editorial Note: NFPA 31 Installation of oil-burning equipment is a standard used by many states for the requirements for installation of oil-burning equipment. Sections 4-4.1.3, 4-4.1.4 and 4-4.1.5 covers the installation of boilers on combustible flooring.*

**An addendum from the *Firepoint* Editor**

The above case study is an obvious application of *pyrophoric* action. *Pyrophric* action is defined as a chemical change in wood due to the intermittent or constant application of heat. The result of normal pyrophoric action is a charcoal like appearance, referred to as pyrophoric carbon. The intermittent or constant application of heat onto a piece of wood will cause it to dehydrate over a period of time, and release carbon dioxide from within dead cellulose cells. Additional heat will cause carbonization, the beginning of the process which turns wood into charcoal. The normal ignition temperature of wood is around $250^0$ C. Pyrophoric action can cause the ignition temperature to drop to as low as $66^0$ C. The effect may occur where a hot steam pipe passes through a combustible wall without adequate space between the pipe and wall. Over time the wood turns black and has a flaked appearance. It reaches a stage where it can self-ignite, when the steam passes through the pipe.

Other examples are found in wood supports behind fireplaces. If the wood is close to metal or masonry pyrophoric action may take place. It is a slow process and may take months or years before the wood will self-ignite at low temperatures. A stove placed directly onto a wooden floor , or on a concrete pad on wooden floorboards, can produce pyrophoric action.

Pyrophoric action should not be confused with spontaneous heating, ignition or combustion.

It is a separate phenomena, one which can be readily explained scientifically, and one the fire investigator needs to be aware of whenever conducting an investigation.

# INCENDIARY V ARSON: Is it just a case of Semantics?

Donald H. Wood
Donald Wood & Associates
Washington DC

(reprinted from the September 1996 edition of *Fire and Arson Investigator)*

Have you ever noticed that most fire investigators use the terms incendiary and arson interchangeably?

Well, in most cases usage of these words depend upon what the investigator was initially taught, or in some cases, simply what the investigator feels comfortable with. Are fire investigators setting themselves up for BIG courtroom losses due to the misuse of these words? In my professional opinion, the definitive answer is YES!

To understand my reasoning, let's first look at some of the basic definitions of arson and incendiary. The first definition comes from *Webster's Ninth New Collegiate Dictionary,* which defines arson as "the malicious or fraudulent burning of property such as a building," and defines incendiary as "a person who deliberately sets fire to a building or other property." I think it is obvious that these two definitions show a definite distinction in the meanings of these two words.

The definition given for arson points out fraud and malice, where as the definition for incendiary only points to the deliberateness of the act.

*Black's Law Dictionary,* sixth edition ("Black"), defines incendiary as "a house-burner, one guilty of arson; one who maliciously and willfully sets another person's building on fire." Black further defines arson in a much broader context; his next definition begins with arson at common law: "the malicious burning of the house of another," and he continues by focusing on state and criminal codes.

For example "the model penal code [Section] 220. 1 (1), provides that a person guilty of arson, a felony of the second degree, if he starts a fire or causes an explosion with the purpose of : (a) damaging any property, whether his own or another's or (b) destroying or damaging any property, whether (it be) his own or another's to collect insurance for such loss."

Again, you can see that this definition is broad in scope and covers most aspects of the crime of arson. In contrast, the definition given for incendiary, even though it addresses malice, does not address the burning of one's own property, including vehicles or watercraft, etc.

Moreover, the definition given for incendiary is by far narrower in scope than the definition given for arson.

Now, lets take a look at some of the more common definitions found in popular fire investigation tests.

According to the *National Fire Protection Association Pamphlet 921,* 1992 edition ("NFPA 921 "), arson is defined as " the crime of maliciously and intentionally or recklessly, starting a fire or explosion": then goes on to explain that the precise definition varies amongst jurisdictions, wherein, it is defined by statutes and judicial decisions.

Notice, the NFPA 921 definition is congruent with Black's definition. Although, NFPA 921 defines incendiary or more precisely incendiary fire cause as "a fire that is deliberately set under circumstances in which the person knows that the fire should not be set," notice that this last definition does not address malice, while the first definition does.

Let's look at another source, *Kirk's Fire Investigation,* third edition, by John D. DeHaan. DeHaan defines arson as "the willful and malicious burning of a person's property."

However, it is interesting to note that DeHaan does not offer a definition for incendiarism. If you look at *The Investigation of Fires* by Roblee and Mekechnie you get your first hint of a true legal definition of arson from a textbook. According to Roblee and Mekechnie, arson at common law is defined as "the willful and malicious burning of the house of another, including all outhouses or outbuildings adjoining thereto."

The authors go on to suggest that in today's legal environment arson is further defined as "the willful and intentional burning of all types of structures, vehicles, forests, fields, and so on." Again, these authors offer no definition for incendiary, but uses it frequently throughout their text. *Investigating the Fireground by* Phillipps and Macfadden are the first textbook authors to show a clear distinction, stating that, "many textbooks use the terms incendiary and arson interchangeably". However, according to Dan J. Carpenter, Fire Administrator and Chief Fire Marshal of Mecklenburg County, North Carolina, "Incendiary means that a fire was deliberately set by a person or persons;" this definition says that an incendiary fire may or may not be an arson fire, depending on the intent of the person who set the fire.

For example, the burning of an abandoned building by the fire department personnel for training purposes, is incendiary but not arson." Phillipps and Macfadden concludes that just because a fire was intentionally set, it does not mean that it is a true arson fire. These authors further suggest, that although a fire may be incendiary in origin, if it is not determined to be arson, it should be correctly categorized as accidental.

In this case, the professional decision for the investigator appears to be whether intent combined with malice is involved. According to this definition alone, the fire investigator can safely conclude that without intent and malice, and particularly malice, an incendiary fire is not the same as an arson fire, and these two words should not be used synonymously.

Finally, understand, I am not advocating the elimination of the use of the word incendiary in the field of fire and arson investigation, but I strongly suggest that it must be used in its proper context. In my professional opinion, the word incendiary *should* be used only to indicate the status of an investigation along with words like: suspicious, undetermined, under investigation, etc.; whereas, incendiary *should not* be used to classify a fire incident.

The potential danger of classifying fire incidents as incendiary, lies in the progressive fire science education of defense attorneys and attorneys that hire savvy consultants. As the knowledge of fire science increases in the litigation world, it's only a matter of time before an acumen attorney will use this legal loophole as a defense on you in an arson case.

The professional investigator must always exercise proactive language, and cease from using the words arson and incendiary synonymously, especially, as long as this gray area exists in our profession. All fire investigators should make a concerted effort to classify all fires as arson or accidental, and understand that the definition of incendiary is not absolute enough to be used as a precise fire investigation classification.

As you know, the crime of arson is based on too much circumstantial evidence to leave ourselves and the community exposed to such a legal loophole, due to the misuse of two words. It's truly, not just a case of semantics.

*(How about in Australia? Have these terms provided any problems? We welcome comments from readers on all our articles)*

# Drawings or Photographs

*by Bernard Beland*

Over the years, this author has had the opportunity to review numerous fire reports. Many of them had almost no text but hundreds of photographs. It seems that taking numerous photographs is stressed to the detriment of good drawings or description of the fire scene. Similarly, technical articles often stress the use of photographs to the exclusion of drawings. This article will stress the importance of a few drawings to describe a fire scene. The characteristics, advantages and limitations of both drawings and photographs will be discussed. It will be shown that the use of drawings is an effective means of properly describing a fire scene and help the reader comprehend the arguments of the reporter.

## PHOTOGRAPHS

A photograph accurately depicts an area of the fire scene in its entirety. This is both an advantage and a serious drawback. The significant information is lost in the background of numerous details that may be useless. Too many things are shown. However, it provides a good record of numerous facts and details.

For a photograph to be useful, it must be described precisely as to what is shown, the position of the camera as well as where it is pointing at. There are numerous ways of providing that information, such as a title that describes briefly what is shown. It is often a good idea to show a schematic plan view of the building with a circle that shows the position of the camera, a number in the circle that indicates the photograph number as well as an arrow that points in the direction the picture was taken. *Figure 1* illustrates the above suggestion. This procedure gives a permanent record of pertinent information. Obviously, the text of the report could describe it more fully.

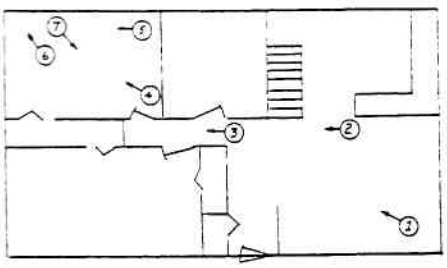

*Figure* 1: Schematic plan view of house. Number in circle refers to photograph numbers. Arrows show the direction camera was pointing.

the pertinent features of the photograph. Many reports include hundreds of photographs with no comments. The reader is then lost as to what the photographs show or even which part of the building is depicted. It is often stressed that as many photographs as possible should be taken. That recommendation has merit. However, a fewer number of well chosen photographs would often be better. These should be discussed fully. Then, others that were taken, but eventually found to be of limited value, could be included in a package and not necessarily as part of the report.

It is often argued that a photograph is a good permanent proof of certain facts. For example, if a photograph shows a gasoline can in a certain spot, that is supposedly a good proof of the fact and of the exact position. The proof is no better than word of the investigator. If a report mentions the presence of a gasoline can, the value of that statement is just as good as that of a photograph. In a matter of opinion, then the photograph is not biased while the reporter could be. But even then, a photograph could also change some of the facts such as the color. The relative position of things could be distorted depending on the lenses used and the angle of photography.

Obviously, a statement as to the exact position of the can or a drawing with the coordinates of the object would provide much more accurate information.

## DRAWINGS

It is often been said that "a picture is worth a thousand words." This is true in many instances but one must remember that a picture is a representation by means such as a painting, a drawing or a photograph. In many reports, pictures are limited to photographs. A drawing could be anything between a sketch to a detailed description of a part of a building or the whole of it. It could be made to scale so that accurate positions are given or, even if not to scale, it could include dimensions. For

the fire report normally only simple drawings are required such as sketches, simplified plan views, and perspective representations. The drawings need not include all details as would be required by working plans for construction. Only the pertinent details and dimensions are required. In fact, one of the advantages of drawings over photographs is that one can show and enhance the pertinent information and not include non-pertinent information. Auxiliary views could also be included to give the details of significant details.

In a report, one must give first a general description of the building, then a more detailed description of the area of origin or the room in which the fire started. Then the details concerning the point of origin are given. This may even require a description of the construction depending on the circumstances. The drawings often have to follow a similar pattern in which a general description is given and then one goes to details. Typically, drawings could include:

i) a general plan view of the building without details;
ii) a plan view of the room in which the fire started with details as appropriate;
iii) details of the area around the point of origin;
iv) detailed sections of walls, floor and/or ceilings around the origin if pertinent;
v) in certain cases, one or more perspective views of the area of origin.

Obviously, depending on the circumstances, some of the above items could be omitted or other items could be added. Some of the above items may give details such as the position of furniture, charred patterns on the walls, floors or ceilings, service entrance, electrical boxes and cables, furnace, windows and doors and numerous other types of information as the case may require. Where pertinent, dimensions should be included.

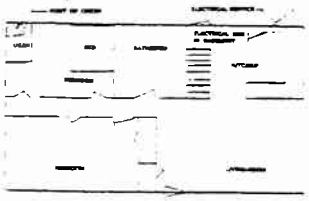

*Figure 2:* Schematic plan view of house with point of origin in bedroom.

*Figures 2, 3, 4 and 5* are typical of the above items i), ii), iv) and v), respectively. These pictures are offered as examples. There are numerous other pertinent ways of presenting the information. Some details that are given in these examples could be omitted and other details added. What should be

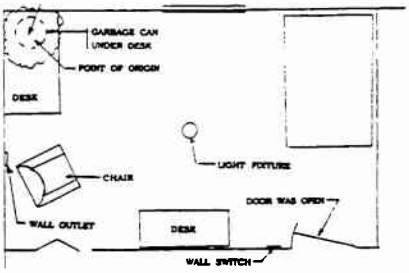


*Figure 3:* Details of room.

shown depends on the circumstances and the intent of the author. Obviously, the text must refer to the figures, explain what is shown and expand on pertinent details. Any of the figures could be labeled with letters or symbols to indicate an area ABCD for example, or indicate a certain point E on the figure. As a general rule, it is probably much better to describe the fire scene from drawings than from photographs. Photographs, of course, could be included and described but would then be secondary to the report. They will be used only to substantiate the drawings.

It is felt by the author, that a report is much easier to read and one obtains a better idea of the premises and the fire damages from well thought and chosen drawings than a series of photographs.

Obviously, drawings require some time. However, much time is saved in the actual writing of the report by referring to drawings. Of equal importance - or even more - the readers will save much time in the reading of the report and obtain a better picture of the fire scene.

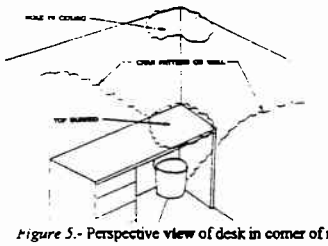

*Figure 5.-* Perspective view of desk in corner of room.

## CONCLUSION

Many fire reports present numerous photographs but no drawings. This article has stressed the importance of presenting some drawings of the fire scene and write the report in relation to those drawings. This should not eliminate the use of photographs. Well chosen drawings could save much time in the actual writing and make it much easier for the reader to comprehend the fire scene and understand the arguments of the report.

# Effective Report Writing

*by Barry R. Jones*
*(reprinted from December, 1995 issue of Fire and Arson Investigator)*

## THE REPORT

Writing an effective report can become tedious or be exciting. Much of how we perceive the task of writing has to do with our own abilities and mind set. In occupations which require written reports, the writer is in essence a recorder. Through the written word, he is able to describe places, events, actions and information in a brief, concise and descriptive manner. His writing style is designed to pull the reader in, thus allowing the reader to use the same logic in reaching the conclusions reported.

The writing must be clear. Proper use of basic English skills is essential. If used properly, the written word is a very powerful tool. Unlike the spoken word, words written live on. Therefore, the words must be chosen carefully, least they reappear to haunt us at a later date.

## NOTE TAKING

Especially in investigative reports, good reports begin with good preparation. While conducting an investigation, the investigator must be mindful that each activity peformed must be reported accurately. Comprehensive note taking is essential throughout the investigative process. Most data collected is far too important to leave to memory. Notes or cues to the writer must be prepared to aid in the future task of writing. These notes must be made in an orderly fashion. Similar in many respects to note cards used in preparation for a research assignment, field notes are the basis for the finished report. The notes should contain all pertinent data, such as times, dates, names, addresses, and other data which may be available.

## DATA COLLECTION

Though each assignment is different, the methods used to collect data are essentially the same. Therefore, a set routine insures each report will be conducted in the same manner. The reports, in turn, will always be complete and meet the writers desire to report accurately and factually the findings.

## BUILDING THE REPORT

Effective reports are built. Like any building process you start with a good foundation, a well performed investigation. You then begin to build the framework, note taking. Then you complete the building process by finishing the project with the best materials available. A sturdy foundation and frame yields high quality workmanship in the finished product which can weather most storms (in our case litigation).

## CONFIDENCE

Confidence is reflected in writing. After reviewing hundreds of reports, it is apparent when the writer is confident in his work and when he is not. Lack of confidence is apparent in the use of vague, unsure terms; overworked and wordy reports; and a failure to commit to a theory or hypothesis hinted at.

Confidence comes with discipline, education and experience. The investigator must be willing to find the answers, rather than hint at unanswered solutions. The investigator must not put imaginary restraints on activities and make excuses for poor performance. He must discipline himself to learn. Many of the talents needed to perform technical investigatfions must be self taught. Seminars and schools are good for the exchange of information and new techniques, but very often they turn into social and political events. At other times the instruction may be self-serving, intended to bolster the instructor's credibility and may not in reality have a scientific basis. Confidence will allow the investigator to distinguish between fact and fiction.

## STYLE

To write effectively, learn to read effectively. Few of us have an innate ability to write effectively without studying style. An effective writing style is the product of hard work. Reading the works of accomplished writers will enhance our own writing style. Pick up a book or magazine. Read it and study the style. Can you apply the techniques to your writing style? Many famous writers have begun their careers imitating the styles of their favorite authors. Soon a unique and promising style of their own developed by trial and error.

## LOGIC

Effective reports are logical. The reader can from the descriptive and logical placement of data within the report reach the same logical conclusions. Investigative reports often become the cornerstone of the litigation process. The attorney handling the case must be able to read the report and understand the points of contention. The facts must be reported logically and factually. An exaggerated report may lead to litigation with no chance of success. An incomplete report may result in a failure to identify areas of potential successful litigation or important information in the defense of unwarranted litigation. Therefore, reports must be be factual, must be logical and must be complete.

## RESULT

In many instances, the style and content of the report itself can prevent costly litigation. Most attorneys litigate when the chance of success exceeds fifty percent. Obviously, if a report is so complete and logical that the reviewing counsel can see no reason for dispute, litigation is not undertaken. This basically means the evidence must be clear and convincing. Therefore, the report should meet the same criteria, it should be clear and convincing. The best way to accomplish this is to simply report the truth. Do not embellish. Do not go on an ego trip. Simply report the facts.

# CERTIFICATE IV FIRE SCENE INVESTIGATION

*The Design and Evolution of the Northern Territory Fire Service Accredited Tertiary Fire Investigation Course*

*Maurie Tong*
*QED Group Pty Ltd*

***Background***

The history of the Certificate IV Fire Scene Investigation Course, which is a nationally accredited and recognised competency based tertiary training package registered with the Northern Territory Employment and Training Authority (NTETA), began in 1988 when as Officer in Charge of the WA Police Arson Squad I was privileged to be awarded a Churchill Fellowship to travel to the United States of America, Canada and England to research fire investigation procedures in diverse jurisdictions.

The main aim of my study during the Fellowship was to examine the efficacy of available training packages and the various operational and resource structures used by various authorities to investigate fires and determine their origin and cause. This was with a view towards implementing procedures that would be beneficial to the bipartisan approach between the then WA Fire Brigades and Police Force to fire investigation in Western Australia.

Whilst the object of this article is to apprise the reader of the training in fire scene investigation now available, it is important I believe, to spend a little time examining how fire investigation in Western Australia and the Northern Territory has evolved since my research in 1988.

At the time of my Fellowship, fire investigation was still in its infancy in Western Australia with the Police Arson Squad having been formed during the early 1980's and with only two members, the previous OIC and me, having received any formal training. That training was through the Tasmania Police Academy's Fire Investigation Course of one week duration, which at that time was the only formal training available nationally. Whilst that course was recognised as a basic introduction to fire investigation only, it was nevertheless a valuable and effective training medium that filled an otherwise gaping void in this country.

As a result of research overseas by District Officers Danny Burgess and Ric Hinch of the WA Fire Brigade and myself, a bi-service agreement ensuring cooperation and a joint investigative approach to fire investigation was created and accepted by the WA Police Force and the WA Fire Brigades. This agreement is still effective today having now operated successfully for the past eight years.

Unbeknown to us in WA, the Northern Territory was considering establishing similar procedures that would be appropriate for their tri-service emergency service structure and as part of their research, Station Commander John Picton of the NT Fire Service attended the Australian Assembly of Fire Authorities Fire Investigation Course held at the Tasmania Police Academy in 1991. He also spent time on exchange with the New South Wales Fire Brigade Fire Investigation Unit.

I met John at the Fire Investigation Course run by the Australian Assembly of Fire Authorities where I was a guest lecturer and as a result of that introduction, the Northern Territory Police and Fire Service invited me to conduct their inaugural fire investigation course at the end of 1991.

We used as a basis for course training material, the lecture notes kindly supplied to me by the National Fire Academy, Emmitsburg, USA, when I attended as a student in 1988. The Academy had been very helpful and were supportive of any efforts to establish recognised and accredited

training in Australia. A similar training manual for courses conducted by the Western Australia Police and Fire Brigades had already been compiled by District Officer Danny Burgess and me and this manual is still used as a reference source today with appropriate upgrades and additions.

For the Northern Territory course, considerable research was conducted and further material from local sources and overseas (with reference to Kirk's Fire Investigation) was also utilised. The material has now been further expanded to include training based upon the Bureau of Alcohol Tobacco and Firearms course and other appropriate matter pertaining to post fire scene investigation techniques and legal considerations.

That first course was of one week duration only, although we attempted to cover material that was designed to meet the needs of a two week course! "Brain death" was the most common comment from students at the course closure.

***Evolution of the Certificate IV Course***

As a result of the first course, a number of discussions were held between the Northern Territory Police and Fire Service and me regarding future development of the course as one week of training was patently inadequate. By this time I had resigned from the Western Australia Police Service and the Territory retained my services as a private training consultant.

We were mindful of the existing course conducted by the Tasmania Police and Fire Service and we recognised the important part that course had played over the years. We decided it was viable to establish as an alternative a complementary comprehensive course that would meet the further needs not only of the Northern Territory but also of investigators from diverse jurisdictions, in fire scene examination and also provide skills for post fire scene investigation.

Accordingly, it was decided that a four week course would be written, designed to meet the requirements of the Australian Fire Competency Standards Level 4 (Australian Standards Level 5) which had been developed as a national guideline and which interestingly, listed the WA Police and Fire Brigades Training Manual (a publication that I had been involved in preparing) as one of the recommended references.

We eventually opted for a four week course for two reasons:

a. We did not consider the range of material required to be covered to meet the competencies adequately could be presented and assessed in less than four weeks as any less would be providing lip service training only; and,

b. A course of this duration was the minimum necessary to meet the content requirement to attain tertiary registration and accreditation nationally.

The evolution of the now accredited Certificate IV course continued until registration through NTETA as a Nationally Recognised Training course in 1995.

The course consists of 200 hours training, with 160 hours of instructional presentation and 40 hours of pre course and after hours assignments.

It is conducted in four modules split into two courses of two weeks' duration each over two financial year periods to meet the students' and their organisations' budgetary requirements for training. The aim is that the frequency of the course can be flexible to meet demand.

Since registration, one complete course of 200 hours has been completed with students from the Northern Territory Police and Fire Services, the Royal Papua New Guinea Police Force, the insurance industry and a consulting electrical engineer having graduated.

Many students, including personnel from the Australian Military Forces, the Air Services Australia Rescue and Firefighting Service, other state police services and the insurance industry have qualified in the first two modules and are awaiting completion of the second two

modules to attain their full certificate. A recognition of prior learning assessment has also been developed for interested students who have completed commensurate training elsewhere.

### *Who's Who*

My research over a number of years has concluded there are distinct disciplines required in the field of fire investigation and that each of these disciplines must operate together in a team environment ("horses for courses"). It has since transpired that my findings were commensurate with the philosophy of the Northern Territory Fire Service.

I believe that all personnel, whether they be police, fire, insurance or expert/specialist investigators must be aware of their limitations and only work within the parameters of knowledge provided by their training and qualifications. Qualification in one specific field does not justify or provide the right to comment on other fields outside that field of expertise, for example, chemists providing electrical opinion and vice versa.

The greatest destruction to the credibility of fire investigation occurs where investigators attempt to be "Jacks of All Trades" and provide unqualified opinion far outside their capabilities. There is a pressing need for fire scene investigation to be conducted in an aura of cooperation between all persons who have a specific field of expertise to offer. Unfortunately, professional jealousy and elitism from diverse sections of the fire investigation community does at times prevent such cooperation.

The roles within the fire investigation field are in my opinion quite clearly defined and
can be categorised as:

1. The "fire investigator" - police, fire and private industry personnel trained in an accredited fire investigation course, preferably a tertiary qualification in fire scene investigation. Conducts overall scene examination and post scene inquiries. Responsible for the coordination of activities within the scene and during post scene investigation to establish fire origin and cause, using the skills of specialist experts as required.

In criminal fires, identifies the offence elements and ensures that all available evidence is located to prove the case to the required standard. Prepares and presents the court brief.

In accidental fires and civil cases performs a similar role to the required standards of proof. Provides a fact compilation and reporting function.

2. The "forensic investigator" - for the sake of expediency I have split forensic personnel from those I class as specialists or experts. Forensic personnel consist of police, fire and private industry personnel who have specific qualifications in one or more of the forensic related competencies, such as police forensic officers etc. Conducts scene examination in conjunction with the qualified fire investigator and is responsible for the identification, compilation and continuity of physical evidence both within the scene and during post scene inquiries. Suitably qualified forensic personnel can of course perform the role of the "fire investigator".

3. The "specialist/expert" - those persons with tertiary qualifications in a specific science or discipline. For example, chemists, electrical engineers, mechanical engineers, structural engineers and metallurgists to name but a few. The foregoing is by no means definitive but list some of the more common specialist persons that must be involved during a fire investigation where required.

It is imperative that all those involved in fire scene investigation be aware of the diverse areas of expertise available to them and use those specialists whenever necessary. Fortunately the days of unqualified personnel being able to provide opinion are, or should be over. We who are involved in fire

investigation must remember this and use relevant experts at all times. In other words, all the different disciplines have their own place and responsibility within the fire investigation. Let the investigator investigate and establish point of origin with input from specialists where necessary; the chemist analyses examine chemicals and assess fire behaviour, the electrical engineer examine electrical components etc.

***Course Description***

Having now got the foregoing off my chest by loosely defining those involved in fire investigation, and I must reiterate that this is not intended to be a definitive list, I will now cover the content of the Certificate IV Course.

Once the need for tertiary qualifications aimed to provide training for the fire investigator as against specialist qualified persons was established (I hasten to add specialist experts are also welcome to attend), we conducted a training needs analysis to identify learning outcomes that would meet the assessment criteria arising from the required competencies for fire scene and post fire scene investigation.

Whilst a comprehensive list of the learning outcomes are available on request from the Northern Territory Fire Service, the following subjects are presented and assessed during the courses:

*Certificate IV Fire Scene Investigation, Modules I and II (100 hours)*

Chemistry and behaviour of fire
Locating the fire point of origin
Fire patterns and spread (practical demonstration)
Accidental fire causes
Electrical theory
Incendiary fire causes
Incendiary and delayed timing devices
(practical demonstration)
Fire scene photography
Fire scene drawing
Scene investigation, security, contamination and chain of evidence
Basic motives of the fire setter
Fatal fires and forensic pathology
Legal requirements, evidence recording & documentation
Collection of physical evidence
Fire investigation report writing
Role of the expert/specialist
Vehicle and machinery fires
Vehicle fires (practical)
Wildfires
Practical fire scene examinations
(assessed syndicate activity)

Assessment for Modules I and II is by written examination and practical student assessment. Tutorial sessions are provided each night of the course and submission of a pre course research assignment linked to Kirk's Fire Investigation Third Edition (DeHaan) is a requirement for course attendance.

*Certificate IV Fire Scene Investigation, Modules III and IV (100 hours)*

Interpretation of statutes
Legal principles
Conduct of court hearings - procedure, demeanour etc
Law of evidence (generic)
Confessional evidence and electronic recording of evidence (generic)
Investigation procedures - investigation defined, the conduct of the investigation, avenues of inquiry, record keeping and investigative audits
Search and seizure
Serial fire setters and criminal profiling
Use of computer data bases
The Insurance Reference Service
Investigative audits, fraud and financial
Insurance
Interview Techniques - witnesses and suspects
Verbal and non-verbal communication techniques
Link analysis charting
Role of the forensic chemist - post scene
Fire reports and preparation of court briefs
Motives of fire setters (advanced and case studies)
Practical fire scene examinations and syndicate exercise

Assessment for Modules III and IV is by written examination and practical assessment.

Since its inception the role of course coordinator has been ably shared between Station Commanders John Picton and Peter Lines, two long serving

and experienced fire fighters. Both John and Peter have qualified in the course and have a vision towards a professional future in fire investigation. They have worked and lobbied tirelessly to bring the course to the stage it is today.

Peter Lines has also been responsible for the design and construction of a two storey burn house and associated fire training ground at the Northern Territory Fire Service Headquarters which provides a flexible, realistic and modem fire investigation training environment. Diverse situations covering a wide range of incendiary or accidental fires can be recreated and most scenes are based upon actual case studies.

The Northern Territory Police Fire and Emergency Services is currently evaluating the practicalities of providing the course at locations outside of the Northern Territory which will provide increased access to many jurisdictions.

*To The Future*

Development and registration of the course has not meant that we are resting on our laurels. Research of new techniques, developments and legal rulings is a continuous project and every endeavour is made to keep the course content up to date. We are aware of the need to provide quality training in the spirit of competency based training dictums and experts in appropriate fields are used to this end.

Specialist subjects are presented by duly qualified electrical engineers, forensic chemists, pathologists, drafting personnel, photographers, accountants, insurance industry personnel and criminal intelligence officers etc.

This course is the only registered tertiary course of its type in Australia and its continuation is imperative to provide the necessary qualifications to meet the ever increasingly stringent standards required by the court system and society. The origins of the course go back some eight years and a great deal of hard work has gone into reaching registration standard. It is therefore pleasing to see the recent proposal for "Draft National Guidelines - Fire Investigation" circulated by the National Institute of Forensic Science, where they recommend a minimum tertiary qualification for fire investigators as TAFE Certificate IV level.

This course meets these recommendations and we invite comment and interest from members of the I.A.A.I. and others involved in fire investigation.

For the future, we intend to continue the Certificate IV Course adapting it to meet changing needs. In addition, preliminary discussion is being held towards designing and writing either a Diploma or Advanced Diploma Course in Fire Investigation Management. If we are successful in attaining this, awarding of the Diploma will hopefully articulate the student through to the first year of a linked university degree course. This is in early stages.

The Northern Territory Police Fire and Emergency Services is ideally situated as the registered provider of the Certificate IV course, to provide both national and offshore training to meet the foreseeable needs of fire investigators.

In closing, may I commend adoption of a positive attitude towards fire investigation by all of us through the implementation of active quality control, training and an understanding of all the roles each of us have to play. Two years ago John DeHaan kindly inscribed my copy of Kirk's thus:

*"Here's to better fire investigations through chemistry and to easier fires to investigate (for all of us!)".*

As I do not still believe in the tooth fairy I don't hold much hope for the latter part of John's inscription however, it is within our power to achieve his first sentiment and, I believe, expand upon it.

Let's not just aim for "better fire investigations through chemistry" but to better fire investigations through the considered and quality application of all disciplines in a team approach and through better training.