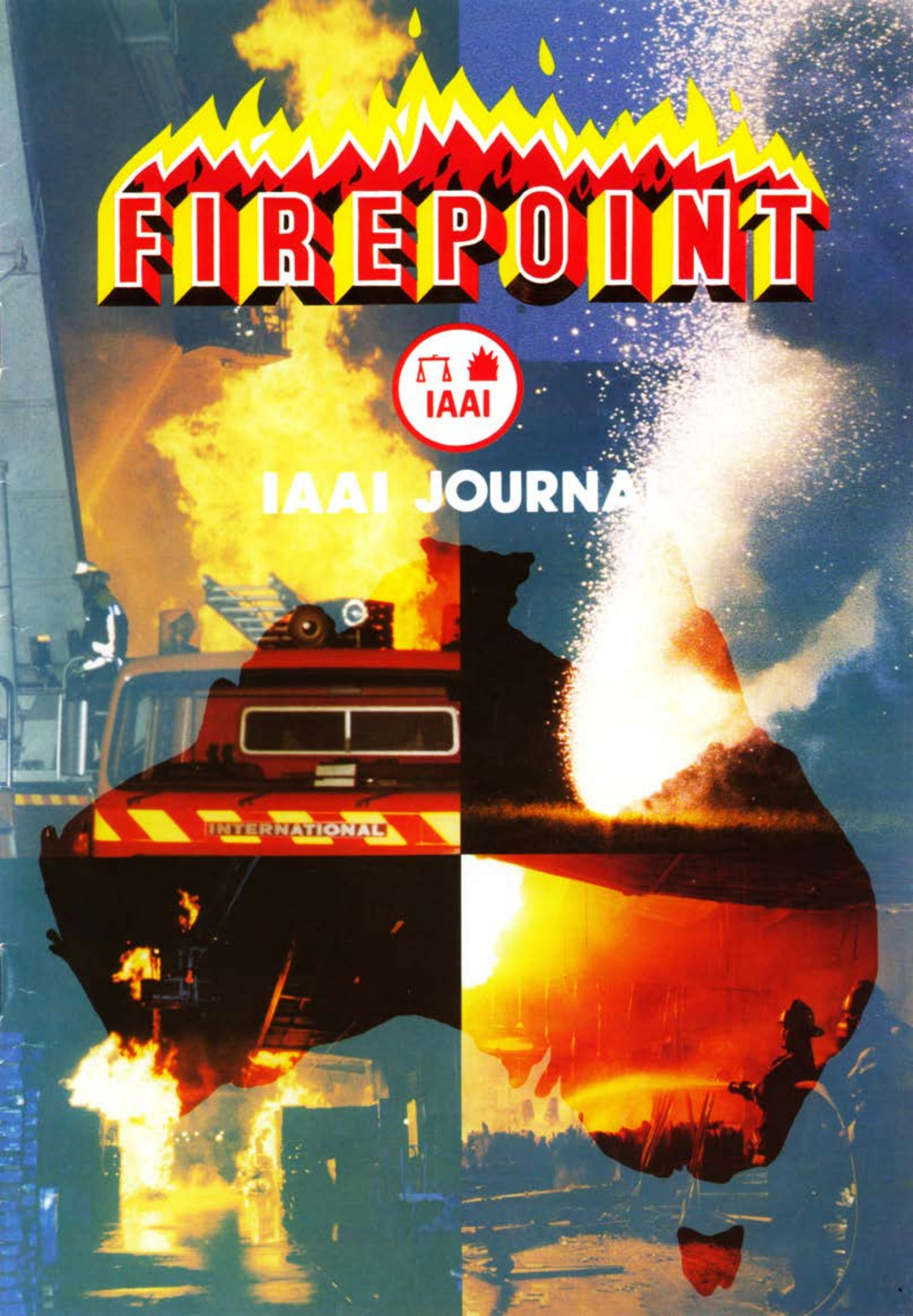
FIREPOINT

IAAI

IAAI JOURNA



Firepoint

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FIREPOINT: INTERNATIONAL WINNER OF THE IAAI 2001/2002 AWARD FOR THE OUTSTANDING PUBLICATION OF A CHAPTER NEWSLETTER OR MAGAZINE.

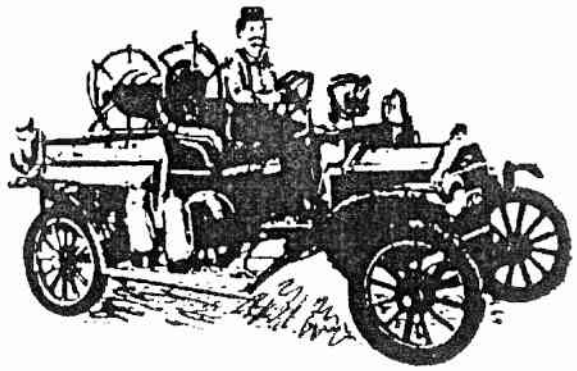
Reminder:
If you have not yet paid your annual membership fee, please do so now

EDITORIAL

On page 3 are listed the web pages for each of our Australian Chapters. Our New Zealand cousins now also have their own site. You can find it at www.fianz.org.nz. If by mistake you go to www.fianz.co.nz, as was first suggested to us, you will find that is the local Federation of Islamic Associations!

This issue features several articles from the Marine Fire Seminar conducted by QAFI in March, 2003. Participants received a CD with all of the relevant articles. A first rate production. Those involved in its production can be very proud of it. A first rate job.

Wal Stern



CONTENTS

Vol. 14, No. 2, June, 2003
Issue No. 54, ISSN 1035 2287

FIRE INVESTIGATION

"The Changing Scene"

2003 SEMINAR

THE NSW ASSOCIATION OF FIRE INVESTIGATORS CORDIALLY INVITE YOU TO THEIR 2003 CONFERENCE, TO BE HELD AT THE CARLTON CREST HOTEL, ULTIMO, SYDNEY.

7^{th} & 8^{th} AUGUST 2003

Guest Speakers will include –

Dr. John DeHaan (Kirk's Fire Investigation)
Kirk Hankins (CFI & Explosives)
Carl Adrian (FBI)
Australian content -
Sgt. Tim Mealing (NSWPol)
Bob Campbell (Qpol)
Karl Kent (AFP)
Paul Westwood (Questioned Documents)

The conference will be of interest to Police, Fire Officers, Forensic Examiners , Insurance Investigators/Assessors/Adjusters/Claims staff, Legal fraternity, Students & others in the Fire industry.

Conference fees : members $400.00 – Non Member $450.00 – One Day $210/230

***** SET THESE DATES ASIDE NOW *****

AN EDUCATIONAL OPPORTUNITY TOO GOOD TO MISS

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PRESIDENTS REPORT

The last few months in the Association have been very busy, with a number of functions held for the benefit of all our members.

Firstly, we were honoured by a visit from Dave Smith from the USA, who attended NSW, QLD and NZ, his tour being funded by the International Association of Arson Investigators. Dave presented a very interesting talk on Monday the 24 March at the NSW Fire Brigade headquarters at Alexandria where he covered the specialist topic of "Fuels, Gas and Explosion Fire Investigation". There was a tremendous response to the session, with over 60 people attending from a range of backgrounds including Fire and Police Service.

I met up with Dave at Greg Hancock's where he was staying in Sydney, talking on the future direction of NFPA 921 Standard for Fire Investigation, which he has been very involved in progressing.

We also conducted the second of our information nights for the Association, at the Ryde-Eastwood Leagues Club. A report of this evening is included below - 25 members and visitors attended in what was a most informative evening.

The third in a series of talks will take place at the Ryde-Eastwood Leagues Club on Thursday the 26 June 2003 commencing at 6.30pm for a 7pm start. (free drinks and nibbles provided). The theme of this night will be a talk (presented by myself) on the 2001/2002 bushfires that affected NSW; where the fires were, and how they were investigated.

This night is not only open for members but is also open to non-members of the organisation so I urge you to spread the word!

In the meantime our Committee is busy making the arrangements for our Conference in August. At this time the majority of guest speakers have made travel arrangements and are booked into presenting some very interesting papers.

Please be aware that there has been great interest from right across the Country from Fire Investigation and Explosion Investigation personnel who are very keen to attend and these early indications suggest that there will a tremendous response to this two-day Conference.

Just a reminder that the dates are 7 and 8 August 2003 at the Carlton Crest Hotel in Sydney. Further information is available on page 5 of this edition of "Firepoint".

A feature of this year's Conference is a trade-show, which will accompany proceedings. I urge any suppliers, or others who may be interested in having a stall at the Conference, to contact either Wayne Shaw, (fellow Committee member from the ACT FB, who is organizing this

aspect of the Conference), or myself.

The other major project which is unfolding is the next development stage of our website and I urge you to keep tabs on it by going to www.nswafi.com.au.

We have also recently organised Membership Cards. You should find yours in the envelope of this issue of "Firepoint". It will be renewed on an annual basis.

Greg Hancock, one of our life members, recently attended the International Association of Arson Investigators Conference in Reno Nevada. I would like to take the opportunity to thank Greg for taking the time out to represent our Chapter at this Conference and look forward to hearing from him on the latest trends and information that was promoted through the Conference.

It is intended that the Conference highlights will be made available to members of the Association via a future edition of "Firepoint".

I would also like to make welcome a number of new members who have joined our Association in the last few months. You are most welcome to offer training and information suggestions to the Executive to provide you with benefit for your membership.

Finally, I would like to wish our Past President, (and former NSW Fire Brigades Fire Investigation and Research Unit member) Don Walshe, all the very best for his future after his recent retirement.

Yours Sincerely,

Richard Woods
PRESIDENT

Report on Video Night

On Thursday, May 1 2003, NSW AFI presented a video night at Ryde Eastwood Leagues Club. Inspector Ross Brogan, from the NSW Fire Brigade Fire Investigation and Research Unit, and Dr Wal Stern, Scientific Fire Investigator showed a number of videos, commented on various aspects of them, and then led a lively discussion on them with the attendees present.

Wal showed three video clips relating to the rapid development of fires, and their transition to flashover. He outlined the various methods of heat and flame development, and the process, causes and characteristics of flashover. In the example of a living room fire, a small fire initiated in a lounge developed to flashover in less than three and a half minutes. In the example shown of a dry scotch pine tree (a Christmas tree decoration) in a lounge room, fire spread to the entire tree, alight from top to bottom in less than 5 seconds, and flashover was reached in less than 45 seconds.

It was shown how a fire in an Irish disco had rapidly developed and proceeded to flashover, causing numerous deaths of young people, unable to escape the flames.

Ross showed two behavioural videos. The first demonstrated the behaviour pattern of bystanders and onlookers, when a fire occurred, and highlighted their often illogical and dangerous behaviour.

The second gave details of a volunteer fire fighter in recent bush fighters, who was found to be a serial arsonist. It detailed the police investigation, following the suspect to various locations, with police acting undercover in the bush. It showed the assistance given by fire brigade personnel in this investigation. The discussion which followed was informative and thoughtful.

The evening demonstrated the advantages of combining video, teaching and discussion, for the education and entertainment of fire related topics.

Welcome

The first five months of the year have been extremely busy for the committee and we are still catching up following the successful conference "Marine Fire Investigations – Staying Afloat" and one day seminar "Fire & Explosion Investigations" .

A full report on both activities will be included in the next Queensland report.

In the meantime, on behalf of the QAFI Executive Committee I wish to sincerely thank the organising committee, speakers and delegates for their individual contributions and support which ensured the success of both training initiatives.

Annual General Meeting

Unfortunately, the Annual General Meeting scheduled for 5.30pm Friday 28th March was deferred due to a quorum not being present.

The rescheduled AGM was successfully held on Monday 12th May at 12 Noon in the O'Shea Corser & Wadley boardroom at which the following members were elected unopposed to the following positions.

President
Kate Ridgway, *O'Shea Corser & Wadley*

1st Vice President
Gary Nash, *Forensic Services Australia*

2nd Vice President
Michael Holohan, *Quinlin Miller & Treston*

Secretary
Robert Campbell, *QPS Arson Squad*

Committee
Adrian Barry, *QFRS - FIRU*
Darryn Morris, *QPS Arson Squad*
Trevor Pohlmann – *RACQ Insurance*

Honorary Solicitor
Quentin Lanyon-Owen, *Hunt & Hunt*

At a committee meeting immediately following the AGM, Aldo Pirlo – Wyatt Gallagher Bassett was nominated and subsequently elected onto the Executive Committee.

On behalf of our members, I wish to thank these dedicated members for their support of our Association and wish them a successful tenure in their elected roles.

Membership

The following membership applications have been received and are currently pending approval by the Executive Committee.

- Adam Gwin, QFRS
- Andrew Lundy, QFRS
- Anthony Mills, Pacific Adjusters Pty Ltd
- Christopher Markwell, QFRS
- Wayne Heydt, QFRS
- Peter Thomas, Freemans Wide Bay Group P/L

It would be appreciated if members who have changed their e-mail address over the past twelve months and not advised us could do so as soon as possible. E-mail is our primary stream of communicating with members. Send to admin_officer@qafi.asn.au

Marine Conference Papers & Certificates

We are pleased to advise that the cd-rom containing the Marine Conference speaker papers and presentations have been posted to all conference delegates along with Attendance Certificates.

A separate Certificate will be forwarded to delegates who sat the exam at the conclusion of the conference.

Exams are presently being marked for both the Marine Conference and Fire & Explosion Investigation training seminar.

IAAI Australian Liaison Report
April 2003

In October 2002 I was contacted by President Lloyd Johnson and informed that David Smith (Nevada) was agreeable to travel to Australia to conduct training, as per discussions with the IAAI Board earlier in 2002.

Negotiations were commenced between myself and the three Australian Chapters in relation to David's itinerary. Once a basic itinerary was agreed, final arrangements were decided between the Chapters, myself and David.

David agreed to include the New Zealand Chapter in his travel plans and he attended the NZ Conference to make his presentation on Fuel and Gas fires/explosion investigation. The conference was held on 20/21/22 March, in Auckland, New Zealand at the Ellerslie International Motor Inn.

I also attended on invitation from the NZ Chapter and presented two papers (Bushfires and Police Task Force operations NSW, Australia 2001/02 – Motor Vehicle Evidence and Preservation of the Scene) A disappointing number of approx. twenty people attended the conference, but the content of the conference agenda and enthusiasm of those attending made for a successful conference.

In consultation with the NZ Chapter I have arranged for a joint arrangement between the NZ Chapter and all Australian Chapters to assist NZ with education and asked them to become a joint contributor to the "FirePoint" magazine (now NSW, Vic. Qld & NZ).

At a meeting with the NZ Fire Service in Auckland, on Monday 24th I spoke of the worth of membership of the IAAI for fire service members, this was greeted favourably by those in attendance.

On Monday 24th David Smith presented a talk on Fuel gas fires/explosions and investigations, at the NSW Fire Brigades Training College, Alexandria, Sydney. Approx. sixty five people attended, from Police, rural and metropolitan fire services, Forensic Science society, Institution of Fire Engineers and NSW IAAI members.

The talk was very well received and those in attendance enjoyed the content. The talk lasted for approx. four hours. The NSW Chapter levied no charges for attendance.

On Thursday 27th, David and myself attended the Queensland Chapter training day, specifically arranged for Davids' talk, at the Royal on the Park hotel, in Brisbane, Queensland. This day was arranged quite separately from the QAFI Conference (28th & 29th) Eighty people were in attendance and David spoke on Fuel gas fires/explosion investigations and a

mobile trailer home fire scenario.

I was approached to chair the day and started by discussing the benefits of IAAI membership, the CFI Program, the Education Foundation and distributed membership applications. Those in attendance came from all states of Australia.

On Friday and Saturday the Queensland Chapter Annual Conference was held at the same venue, with 75 people in attendance. David spoke on NFPA 921 and the relevance in Australian conditions. The theme of the conference was Boat/Ship Fires and Investigations. I made a presentation on investigating ship fires.

The Queensland Chapter were extremely good hosts and the content of the conference was excellent; I would have to say the best conference I have attended (for content, continuity of speakers and relevance to the topic). Those in attendance were from Police, Fire, Insurance, Legal, private investigators, Institution of Fire Engineers and Federal Government agencies. At the conclusion of the conference I congratulated the conference committee on an excellent job, well done, on behalf of the IAAI.

I initially worked in consultation with the Queensland Chapter committee to arrange the speaker content for the conference. The original thoughts were that we did not have the specialised talent in Australia to cover the topic of ship/boat fire investigations adequately; this being a highly specialised area.

The committee, on my suggestion, sought a speaker from Burgoyne and Company in London (being a specialised, world renowned ship fire consultant) but this arrangement fell through.

In the end I would have to say that the final speaker content was world class and could not have been better suited to the theme. I think the Qld. committee should be very proud of the world class event they produced – Congratulations!

In summary, I consider the service provided by David Smith, via the IAAI, to have been of great benefit to Australian and New Zealand investigators and is appreciated by all involved.

I consider the addition of the New Zealand Chapter to the travel itinerary for this kind of education to have been well worthwhile. The NSW Chapter would like to thank Greg Hancock CFI for providing hospitality to David and Linda Smith during their stay in Sydney.

Finally, I would like to thank President Lloyd Johnson for showing faith in our suggestion of education travel throughout Australia and it's overall benefits. We look forward to working together on this arrangement in the future.

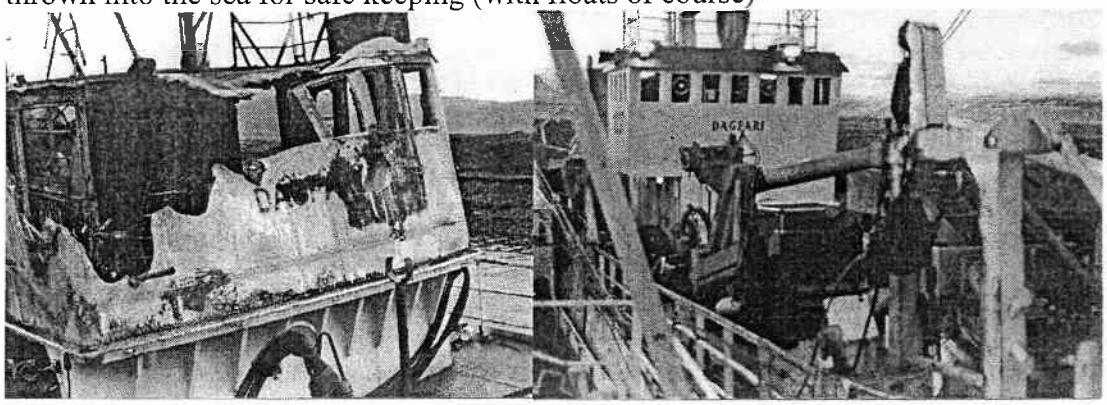
Ross Brogan
Australian Liaison
NSW Fire Brigades
Fire Investigation
Research Unit.

Investigation of Pleasure Craft Fires (Part 1)

A paper presented to the QAFI Seminar "Staying Afloat" in March 2003 by Ted Beitz
Fire Scene Examination Co-ordinator
Queensland Fire & Rescue Service

My affiliations with Marine Vessels commenced in 1978 when I spent two years in Iceland as 2nd engineer on fishing vessels.

"Grandmother of Tunga" was a 450 tonne, fishing trawler and we fished off the coast of Iceland for 10 days at a time to catch 100 / 150 tons of fish per trip. My first encounter with Marine vessel fires was while working aboard this fine ship. The first fire was in the winch drums of the main winch used to lower and haul in the trawl net from a depth of up to 400 fathoms. The fire was quickly extinguished using Dry Powder. The second fire was a little more serious. One morning in fine conditions we were having a chat on the bridge with the Captain when a crewman noticed smoke coming from the Port side engine room ventilation shaft. Cautious entry to the starboard side of the engine room revealed a small fire developing in the lagging around the exhaust manifold that was being fuelled by diesel from a broken injector line. The first engineer had cross ventilation set up in the engine room so it was clear as a bell on the starboard side and he calmly walked over to the injector pump with a shifter and shut the fuel off to that injector line. The fire was easily controlled from that point.
A fellow fishing trawler was not so lucky. "Dagafri" had a galley fire that spread to the wheelhouse that was constructed of aluminium which melted and allowed the fire to vent vertically and stop lateral travel. The Insurance Company called the ship and ordered the nets thrown into the sea for safe keeping (with floats of course)

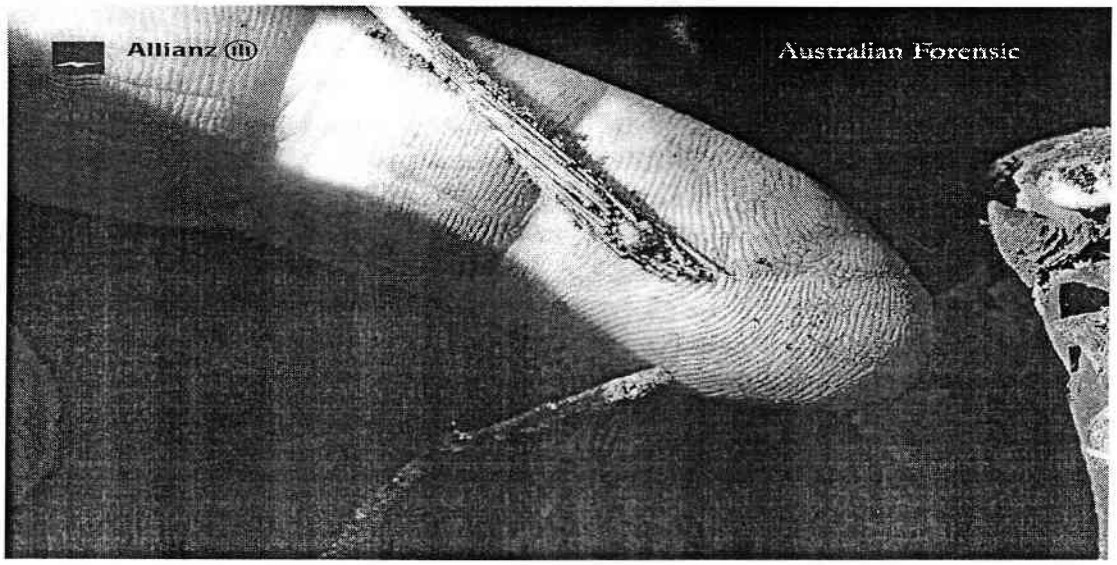


Dagfari burnt out **Dagfari rebuilt**

WHAT CAUSES FIRES IN MARINE VESSELS

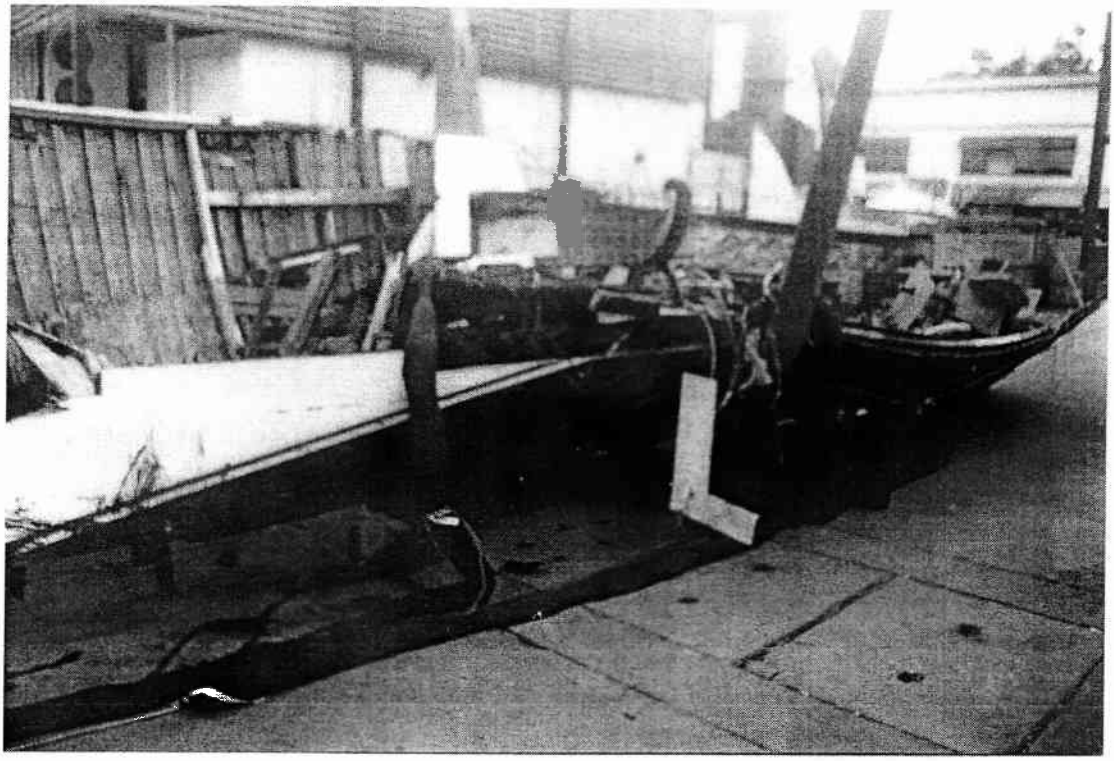
- Electrical shorts
- Vapour explosions
- Mechanical malfunctions
- Gas Stoves and pilot lights
- Maintenance procedures
- Cargo handling

Electrical Faults on marine vessels are high on the list when it comes to determining the cause and origin of a fire. In my experience I have found that one of the problems is the home handyman. He will often hook up a new depth sounder, bilge pumper, spot light and forget his protection which is the in line fuse. If a fault occurs with no fuse in place the cable will heat until the cable insulation reaches ignition point and we have an onboard fire. Vibration is also a concern that may lead up to an electrical fault. Cables that are not secure in a loom may come in contact with structural components of the vessel and suffer damage to cable insulation with the resultant exposure of live wires. Vibration can also be the cause of hot electrical connection caused by screws coming loose at terminals and connections. It is a good idea to have a maintenance program that will include the retightening of electrical connections at least once in the life of a vessel. The other problem we face with electricity on vessels is the normal operation of all electrical components like switches, motors and appliances. If we have a build up of fuel vapours in the bilge of a vessel, the spark produced in most electrical components under normal operation, may be enough to cause ignition of the vapours.



Pictured is an ARC from an unprotected circuit found in a switchboard

Vapour Explosions are another cause of explosions and fires in Marine vessels that use two and four stroke fuel or use gas appliances. Explosive vapours are produced during refuelling operations, accidental spillage or when a fault occurs that allows fuel or gas to leak into the bilge area of a vessel. Petrol and Gas vapours are heavier that air and will always go to the lowest point. The fact that the construction of a vessel is tub like, the produced vapours have nowhere to escape to, so the result is an accumulation of vapours in the lowest point of the vessel. Sources of ignition for a vapour explosion can be a small electrical spark in a switch when it is activated or a gas pilot light of someone lighting a cigarette. The vapour explosion produces devastating results.



This vessel exploded and sank due to a vapour explosion within one minute.

Mechanical Malfunctions. Failure of components due to mechanical failure is another contributor to marine vessel fires. Friction is usually the bi-product of a mechanical failure. Heat can be produced from a failed bearing, failed insulation on electrical cables, overheated brake linings on a winch, broken fuel injection line onto a exhaust manifold or ruptured hydraulic lines are some examples of mechanical malfunctions that could lead to a fire.

It is important in all investigations to get an accurate maintenance record of repairs that have been carried out were due to be carried out. The Captain or the Engineer of the vessel will usually provide this information.

Gas Stoves and Pilot Lights on Refrigerators and Water Heaters constitute a readily available ignition source on all vessels. The two main areas of concern are unattended cooking and a vapour explosion due to spilt petrol products or gas leaks

Maintenance Procedures. On the Gold Coast in the last five years, fires have caused $10 million damage to pleasure craft that were undergoing repairs or maintenance. In most of the cases it was not proved exactly what started the fires. Work being carried out prior to the fires included the fitting of new electrical components, rewiring electrical circuits and sanding and revarnishing timberwork. Careless use of cleaning products and procedures can lead to fires onboard vessels. The two most likely causes are a Vapour Explosion due to volatile cleaning agents like thinners that are often used to wipe timberwork prior to the application of varnish. Spontaneous combustion from carelessly discarded rags after varnishing timberwork, into plastic rubbish bins on board has also been the cause of several fires on marine vessels.

Cargo Handling is another area on board a vessel that can lead to fires and explosions (eg dust explosions) but not common on pleasure craft.

What are the problems we encounter with investigation of vessel fires: -

Access to the incident is our first obstacle. Queensland Water Police, Air Sea Rescue or a Department of Transport vessel usually transports us to the scene.

Location of the incident
On Gold Coast in the last 10 years we have had approximately 20 fires involving Pleasure Craft in the form of Runabouts (3 to 6 metres in length), Larger Motor Cruisers and Yachts (6 to 30 meters) and House Boats and Tourist Charter vessels (10 to 30 metres).
On average half the incidents occurred at the dock and the other half at remote locations in passages of the Gold Coast Waterways.

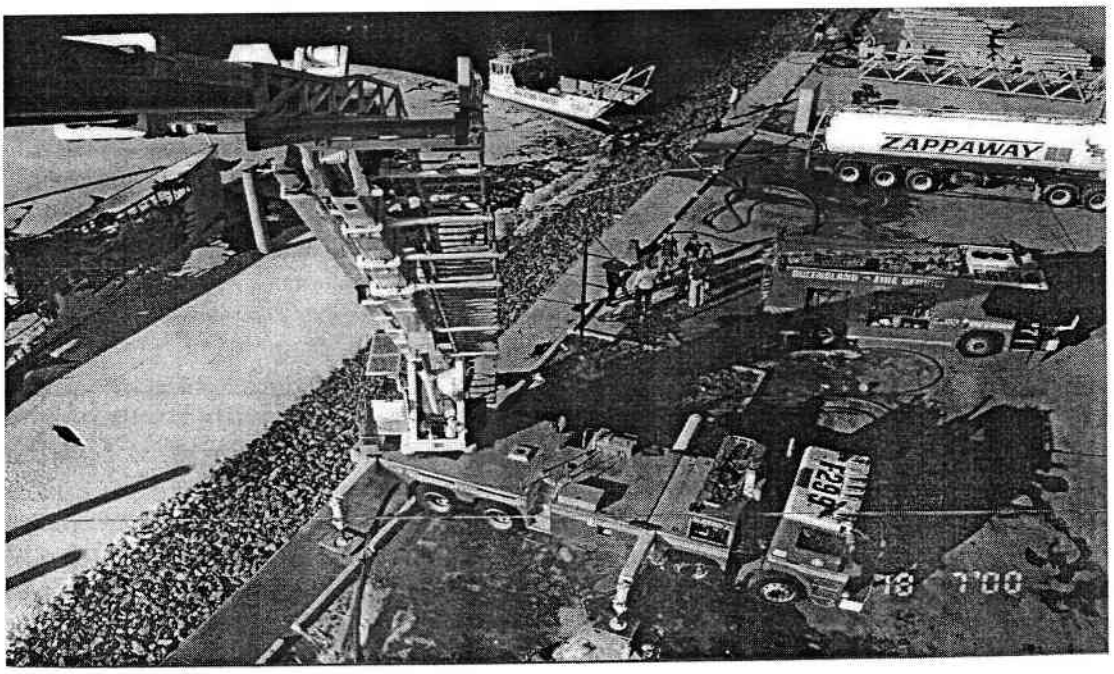
Stability and the Tide is our next problem. Will our investigation procedures be hindered by the fact that the structure is unstable and in danger of breaking up or will rising waters cover our evidence. If this is the case we must gather as much information and evidence as quickly as possible. Photographs of the incident are our first consideration as it may sink and not be recovered of sections may be lost in the recovery process.

Pollution of the waterways can be a concern as the rising tide may cause fuel oil to escape into the waterways. We should all be aware that the Department of Transport is the Harbour Master in all ports in Queensland. They are to be notified immediately of a vessel fire where a large fuel leak may be the outcome of a fire. Department of Transport vessels respond with bonding barriers and fuel absorbent floatation devices to contain the spill.

Floatation and Relocation of the remains of the vessel for examination is our next task. On the Gold Coast we have a new facility at Coomera known as Gold Coast City Marina. This facility has a travel lift with the capacity to lift a 150 tonne vessel on to hard standing.

Gold Coast City Marina - The Travel Lift at GCCM has 150-ton lift capacity.

Achilles Gold Coast City Marina



Use the Media as one of your valuable resources.

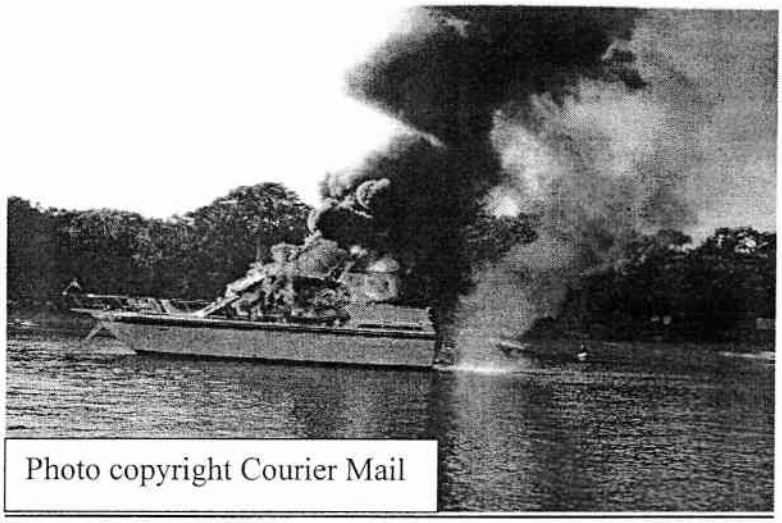


Photo copyright Courier Mail

You will often investigate a fire hours and days after the incident. A picture tells a thousand words and getting that picture will often be difficult as the boats that were a witness to the incident have pulled up anchor and left no forwarding address. So what to do? If you see the photo in the newspaper then you have the opportunity to get a photo first hand. It will cost you money and it will usually be copyrighted but at least you now have a picture and usually they will have several more other than the one that was printed.

The Investigation Process

To be a successful Fire Investigator you must base your findings on a sound investigative process. You as an investigator must really understand how a fire burns, what factors control its behavior, and that all fires do not necessarily behave in a precisely predictable fashion. Such conditions must be correlated with the fire conditions and their causes established. These causes usually involve the nature of the fuel involved or the physical circumstances and the environment of the fire. It is important to understand the fundamental properties of the fuels involved. Fuels we are likely to encounter in marine vessel fires would be petrol's, diesel, butane gas, fiberglass and timber. The properties of these fuels include, the density, thermal conductivity, heat capacity of the fuel, determine the ignition point and flame spread characteristics of the fuel. The properties control the nature of ignition as well as the events that follow ignition.

To gain an understanding of how these fuels react in a fire situation it is important to take part in as many trial burns or to carry out your own experiments from time to time.

Fellow Investigators, I could go on with much more information but I have tried to keep this session relatively strait forward. Develop your investigative process and base it on recorded fire patterns, substantiated fire development of involved fuels, occupier and witness statements, investigative procedures, analysis of evidence by the Department of Industrial Relations Electrical Approvals Officers, QPS Scientific Officers and Private Forensic Companies and you will not go to far wrong. **If after all that it is still undetermined then that is your result.**

(This is the first part of this paper. The second part, a detailed case study, will be printed in the next issue of "Firepoint").

From the Sublime to the Ridiculous

Experiences Accompanying Scientific Investigation of Marine Fires

A paper presented to the QAFI Marine Fire seminar "Staying Afloat" in March 2003 by Terrence P Casey BSc BTech SMIEAust Ceng from Forensic Services Australia (Qld) Pty Ltd

In this paper I intend to touch on the unusual, the ridiculous, the rigorous, the controversial but also the satisfying aspects that I have found in the role of a professional, investigating the circumstances surrounding the cause and origin of fires from the perspective of science and engineering.

Experiences have ranged from fun and freedom to those of the ethical influences and dilemmas raised by an understanding of the impact our evidence may have on the interests of a client and still approach an investigation from, as best we can, an unbiased perspective. Fortunately there are occasions when, irrespective of the results of an investigation, a client and the insurance industry in general may benefit from the very fact of investigation of marine fires.

The Trawler Fires

The Sublime

The first of two trawler fires occurred deep within Princess Charlotte Bay, quite some distance north of Cairns. The instructions were a little unusual, as the vessel had burnt and sunk, a salvage crew was in the process of hauling the damaged hull onto a coral cay, reaching the scene would be by seaplane from Cairns and the vessel examination was to be carried out in the isolation of that region of the Queensland Coast.

However, on approaching the scene there was no trawler visible, just the recovery barge. Once I managed to board the barge, my question about the location of the boat was answered by a casual glance towards a line which disappeared into the ocean and the comment: "At the end of that line".

While I had been a keen swimmer for years and done my share of snorkelling, the problem was solved when a Maori member of the crew offered to give me half an hour instruction on the use of a hook line and offered to have two scuba divers accompany me while examining the wreck.

The dives provided some insight into the origin of the fire and, as demonstrated by a sketch of the damage, highlighted facts which supported the description provided by the crew of the trawler, once they had discovered the fire. This information was enough to provide comfort to the Insurer that the loss was genuine and that the claim could be settled.

However, before we flew out, what was an empty part of Princess Charlotte Bay now had seven or eight trawlers anchored around the salvage barge. You can imagine the radio messages that swept through the fishing fleet, describing the bizarre scene of a fire investigator arriving by seaplane and carrying out an underwater investigation of a burnt trawler. The message that the fleet would have received was that Insurers will go to extreme lengths to determine the validity of insurance claims.

It may be that such an observation just may have prevented a pressured owner from choosing fire as a way of liquidating assets.

The second fire was linked to the first in three ways; one, they were both trawlers, two the second trawler had also sunk and three the salvage crew for both included the same Maori crewman. Having been assured in instructions that while the vessel was lying in only about 5 to 10 meters of water and was

an hours sail off the coast; it was therefore in an area of relatively safe diving. This time, equipped with a good set of fins, a new face mask and some underwater writing materials, I arrived on the recovery barge to find that it wasn't an hours' sail off the coast, but up the coast, within easy view of mangroves, crocodile slides and the obvious possibility of marine stingers.

Fortunately, visibility was only two feet so that I was able to say: "No point in me diving, I couldn't see enough to make it worthwhile. You'd better bring it up and lay it on the deck of the recovery barge".

That process left me free, with the Maori, who was a very keen fisherman, to use a small dingy to travel to the nearby island and in about five minutes to collect two buckets of some of the biggest oysters I've ever seen. That's part of the sublime mentioned in the title.

During the evening meal, with lights of the recovery barge lighting the ocean, the Maori crewman saw a large fish swim through the light and immediately decided that he would try his luck. As soon as his line hit the water, hundreds of squid appeared and, when he had changed his hook for a jigger, we had the freshest squid barbecued to go with the oysters. By the way, the investigation was also useful as the examination on the deck of the recovery barge revealed evidence again consistent with the claims of the crew.

Reef Link II
The Rigorous

The results of many vessel fire investigations, such as the two trawlers I have just mentioned, are inconclusive; however, they often provide enough evidence to assist the decision processes of the insurer. In contrast, the fire that destroyed Reef Link II was one which eventually wound up in Court for a decision as to the specific cause of fire ignition.

Reef Link II was an aluminium catamaran designed for the tourist industry and capable of carrying up to 400 passengers on tours in the Barrier Reef area.

Only a matter of weeks after its sea trials, Reef Link II caught fire within sight of the mainland on its trip towards one of the resort islands. Fortunately it was a Sunday so there were many pleasure boats on the water and there were only 40 passengers on board so they were readily rescued before the fire had developed to any substantial extent.

But develop it did, with the net result that fire destroyed the super structure and locally melted the aluminium plates of both hulls.

The general severity of damage indicated that the fire had developed in the aft sections of the super structure and the examination of the engine rooms revealed that the fire had initiated within the starboard engine room.

Early examination suggested that the nature of restraint of heavy current cables was a possible the cause of an electrical malfunction; however, comparisons with similar arrangements in the port engine, supported by metallographic evidence, strongly suggested that this mechanism could be eliminated.

A detailed examination of the engine room revealed a pattern of fire spread from the inboard side of the starboard main engine. Examination of this area revealed that a section of the primary circuit conductor to the starter motor slave solenoid was fused but remained intact; hence, it had been carrying a high fault current.

There was evidence of local discolouration and partial melting of the steel body, further highlighting the intensity of resistive heating in the circuit. The temperatures necessary to partially fuse copper and locally melt steel would have ignited the polymeric insulation,

adjacent looms and some spilled diesel fuel.

During the civil trial it was held that an electrical malfunction, involving the slave solenoid, had caused ignition of the fire and, given the age of the vessel, it was held to be a manufacturing defect so that the insurers of the vessel were able to recover their losses from the manufacturer.

An Old Sailing Boat Fire
Pre-trial Communication

This matter settled during a Civil Trial in what was described by the insurer of the vessel as a satisfactory commercial result; however, based on the physical evidence, the insurer should not have been found liable.

The circumstances of the fire were that the owner, having had a substantial number of friends ferried to an adjacent island, claimed to have begun to cook fish for lunch in a 300mm camping oven on a gas stove within the galley.

He claimed that while waiting for the oil to heat he made a cup of coffee and in doing so had spilt the coffee on his arm and then was in such pain that he was compelled to dive overboard. He was picked up by the only crew member left onboard and was ferried to the island some 200 metres away.

As he was helped from the runabout onto the shore, the fire was seen to develop from within the vessel. Examination of the galley showed minimal charring to the soft wood timbers above, to the side and behind the gas stove; however, much more severe damage had occurred within the engine room on the other side of a separating bulkhead.

A full scale ply and pine model was constructed of the galley and, at the site of the camp oven, a 150mm saucepan of oil was heated to ignition.

During the first two minutes of combustion, this saucepan of oil did more damage within the model than was suffered by the vessel in question which burnt for over half an hour. Based on the specific heats of cast iron and vegetable oil and using the known heat output of the stove installed in the vessel and the ignition temperature of vegetable oil, it was calculated that it would have taken over 45minutes to ignite the oil in such a camp oven, ignoring the effects of heat loss as the ignition temperature was approached. Hence, it could be clearly shown that overheating of cooking oil in the galley could not have caused the fire which led to the economic destruction of this vessel.

Counsel representing the insurer had copies of these results; he had requested a video of similar simulations for presentation in court, a move he thought was necessary to overcome an expert witness to be called by the defendant who had proposed an unbelievably short period of time of development of the cooking oil fire.

Involved in another substantial fire trial in Brisbane, I was unable to get the video to him prior to my attending court and in the absence of this video I understand the counsel chose not to proceed.

I believe this particular case highlights the need for legal counsel to fully understand the weight of the evidence they are dealing with and be confident in that evidence.

The Fantastic
Misleading or misunderstanding evidence

This vessel was an aluminium pleasure craft extended from its original design length of 40 metres to approaching 50 metres. In place of two high speed marine diesel engines, the owner had chosen to power it using three petrol fuelled 454 cubic inch supercharged Chevrolet racing engines.

It was being developed as a super luxury cruiser to be sold to some wealthy

American for his use in Perth for the America's Cup series; however, production problems meant that it failed to meet the deadline. Hence, it reportedly became a rather unreliable albatross around the owner's neck.

The vessel caught fire and burnt causing very severe damage to the aluminium hull, engine room and accommodation spaces. At the time the fire was detected, a crew member, a friend of the owner, had been directed to go to the engine room to check that everything was running properly.

An explosion occurred in the engine room and the crew member was ejected from the engine room hatch into the ocean behind the vessel. He was thrown a life ring and eventually rescued and found to have minor burns to one arm and the face. The vessel was eventually beached where the fire was finally extinguished and a large quantity of sand dumped in and around the engine room.

Unfortunately the early police examination was cursory, as was highlighted by the fact that they reported that the "carburettors" had been removed by persons unknown prior to recovery of the vessel.

The remains lay in a holding yard for several months before a dogged, though by reputation somewhat suspect, private investigator accompanied by a Police Officer had a good look in the engine room.

Beneath the sand they found a screwdriver with an arc strike to its tip and the remains of a yellow plastic bucket in which was found some coils of relatively fine wire connected by jumper leads to the battery of the auxiliary alternator set. Analysis identified traces of petrol in the bucket remains.

Arrangements were made to clear the hull of remaining sand and at that stage I was instructed to examine the vessel to determine the cause and origin of the fire. The symmetry of damage identified the engine room as the origin of the fire but it did not identify an area of fire origin which was consistent with the location of the plastic bucket remains.

However, amongst other material recovered by the Police Officer and private investigator, were the remains of two control switches for the gas detection system necessary in a petrol powered engine room. While one was severely damaged by the fire, the other was less severely damage and was clearly in the OFF position.

While not wanting to go through the rigours of the cause and origin investigation, my point here is that during an investigation into laying arson charges, staff of the DPP had presented some photographs of evidence to an independent scientist from one of the universities.

A record of interview of that meeting indicated that the scientist was told that there were claims that a plastic bucket had been recovered from the engine room along with a screwdriver and that neither showed substantial fire damage. The scientist had seen the fire damaged condition of the "Fantastic" while 300mm of water remained in the hull and concluded that, given the melting of many aluminium components within the engine room, the survival of such items was impossible.

The scientist was not told that the remains of the plastic bucket was charred and blackened on the upper surface, recognisably yellow on the lower surface, with the remaining bottom shape of the bucket curved to the shape of the hull. He was similarly not told that the screwdriver had been recovered from beneath sand and was also in contact with the hull.

My examination of the vessel, in particular damage to the hull plates in the bilge, highlighted the fact that there was

about 50mm of liquid in the bilge during the fire, as shown by the survival of surface paint and plastic components of the bilge pumps.

I subsequently spoke face to face with that scientist and showed him what I had located and described the bucket and he was quick to agree that they certainly could have survived the fire as suggested in the police brief. It was concerning to find that the scientist had been briefed with incomplete or misleading evidence by the DPP.

The decision was taken not to proceed with the criminal prosecution. Eight years later, the Civil Courts found strongly in the favour of the insurer but did not rule on cause.

Timber Pleasure Craft *The Ridiculous*

So we come to the ridiculous. This fire involved a relatively small timber pleasure vessel that had been slipped so that anodes could be welded to the heavy steel keel shoe. It was claimed that during this welding the vessel caught fire. The vessel had an inboard diesel engine.

I found that the fire had started in and around the engine and, while the owner reported no additional flammable liquids abroad, analysis revealed significant amounts of kerosene in the bilge sample.

The insurer chose to deny liability, given that the fire had started within the engine room, not associated with external welding, and that there was unexplained kerosene in the bilge.

During the civil trial a scientist called by the defence, having read my report provided two "highly plausible" alternative explanations of the cause of this fire.

The first involved stray currents caused by the welding which travelled the full length of the keel shoe through the propeller shaft bearings along the propeller shaft to the transmission, through the transmission and up through the earthing strap to the battery. Without explaining how the circuit was closed through the positive terminal of the battery, this current flowed through the battery, generated hydrogen and some unexplained defect within the battery caused that hydrogen to be ignited and hence that ignited unidentified flammables within the engine room. I have given that explanation to a number of Year 12 science students and they, thankfully, thought it laughable.

The second alternative was that the heat from the welding had been transmitted up the keel bolts which were about 175mm long and that heat then ignited contents of the bilge.

My photographs, already in evidence, showed the heads of the keel bolts in the bottom of the bilge still painted white after the fire. It is hard to imagine enough heat being transmitted through the head of the bolt without blistering the paint, to ignite any contents of the bilge. An assessment of this evidence as ridiculous would be generous.

It is hard to imagine any person qualified in the physical sciences making such a submission under oath as remotely possible let alone plausible.

I find the existence of such evidence highly unfortunate as it gives credence to the quote of a judge who tended to disregard expert witness evidence as they, being paid for their work, tend to do something serviceable for their client.

I know similar sentiments have been expressed amongst the judiciary today and unfortunately there are far too many instances which would give comfort to this view.

So there you have it; fire investigation from the sublime to the ridiculous – or worse.

VICTORIAN CHAPTER REPORT

Committee News

Recovery from the Victorian North East Fires and the closure of the MFESB College in Abbottsford has hampered the committee's efforts in presenting any sessions for the members. There has been concentration on the operations and recovery from the fires with many debriefs to identify the weaknesses and strengths and the multi agency co-operation on such an extended campaign fire. With the closure of the MFESB College, apart form the relocation (twice), the loss of the auditorium has effected plans for conducting sessions. The committee is still working towards presenting training sessions in the near future.

AGM

There will be an Annual General meeting held during July. Any member interested in being part of the committee should contact the committee for information. Election of which committee members will be detailed in the AGM flyer and members are encouraged to attend.

MEMBERSHIP

All members should have received a new certificate and badge. Those who have not, contact Bob Hetherington Chapter Registrar. Remember that Chapter fees are due as at 1st July and accounts will be forwarded by post.

Marine Fires and Fire Investigation on the Water.

Abstract of a paper presented to the QAFI Marine Fire Seminar "Staying Afloat", in March 2003

***by Ross* Brogan**

Fires involving ships, boats or vessels of any kind cause damage exactly the same as land-based building fires, the only difference being the type of construction and the location.

Construction and access to waterborne craft make the biggest difference to the speed and spread patterns of fires involving internal spaces, most times creating difficulties for both fire fighting and the ensuing cause and origin investigation.

When investigating fires involving vessels it should be determined whether the SOLAS (Safety of Life at Sea) convention applies to these ships and if any regulations have been contravened, as authorities may need to take this into consideration when finalizing investigation outcomes.

Waterborne craft involved in fires can be anything from a small outboard motor-powered runabout, cabin cruiser, sightseeing cruise vessel, naval vessels, cruise liners or large bulk-carrier tankers/ships.

Fires can engulf motors, engine rooms, fuel equipment, accommodation spaces, kitchens or cargo spaces. Causes can range from electrical faults, spontaneous heating, fuel related spills/leaks & explosions, cooking/heating, smoking in living areas, and, as anywhere on dry land, arson.