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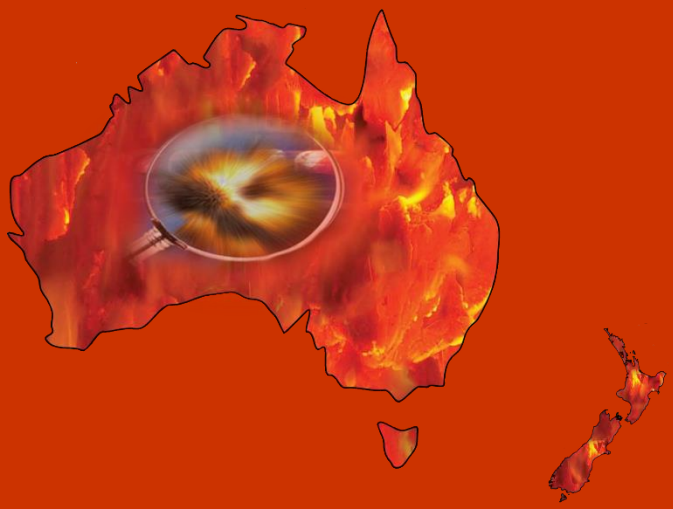

AAFI Journal

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Contents

Editorial

Welcome to the third edition of the online FirePoint and the last of this the first year, 2016. It has been a big year for the Australasian Association, we as a group of associations have produced several online magazines, a national conference and progressed with formalising several of the group activities.

Again we need articles, case studies, editorial comments, photographs, pictures or cartoons and advertising to make this magazine the best and most informative magazine possible.

The magazine will continue to be published twice a year at this stage, we are happy to receive comments on this discussion. The next edition is planned for March/April 2017.

This edition we will be awarding contribution prizes for different categories, theses may include:

- Best article.
- Best photograph.

These will be judged on feedback from the readers, chapter committees and the editorial committee. Prizes will include book and hardware vouchers and will be announced in the next edition.

We cannot have enough content in the archive ready for the next editions, please forward anything you can contribute, even ideas.

The national conference was a great success and well done to the NSW Association for a job which has set the standard, the learnings and social functions are still being talked about.

With Victoria hosting the next conference in 2018, planning has started and the organising committee will soon be sending a survey out to assist with the planning, this will be sent to all attendees of the last conference and chapter representatives for you to participate in, please assist with a timely response.

We look forward to the future discussion and contributions to FirePoint.

Please have a safe Christmas and fire season and we look forward to hearing from you all in the new year.

Regards
Fire Point Team

President's report

Welcome to the 3rd edition, it great to see the feedback about the magazine, we are looking to a greater contribution from the members to make this magazine valuable, please forward any content to the committee for inclusion into the magazine.

The recent annual general meeting held in conjunction with the November training session saw several changes, these include the retirement of Rod East, our treasure for 14 years, on behalf of the members and committee, I thank Rod for his long and dedicated service, and we welcome Steve Attard who joins the committee.

Our website is almost complete and a new login and email system will be used to communicate with VAFI members. We are also look for images to include on the web pages, so please forward these to the committee members.

Our training sessions have been well attended, but we did need to reduce the Court Room training to one day, it was indicated that a lot more people intended to participate, but this did not occur, the committee put a lot of work in to these training programs and we would like to see members step forward to participate in their own personal development. This is the main aim of the Association, we provide the training for individual personal development in the area of fire investigation.

Please consider what you can provide to the association by your attendance or presentation at a training session, please contact the committee to discuss. I received one offer at the AGM, which will be taken up, the member said it was just a small fire but had good learnings from it, this is what we are looking for. Some great learnings can come from a small fire with the evidence that can be viewed. We don't get too much from fire down to the stumps. So a 15 minute presentation can be fitted in to a training session if that is what you have, please step up.

We are planning our next year training schedule which will soon be added to the website

As always, we invite members of the other Chapters to attend any of our training sessions.

Please check the website for updates on the training schedule and other important news, we will continue to also use the email system to notify members of events and news.

I hope the Emergency Services have a quiet fire season.

Please stay safe on the fire scene, and see you at the next training session.

Michael Weekes
President – VAFI

Articles

I know what started the fire, but I don't know what 'it' is…..

Senior Station Officer Michael Masters
Shepparton Fire Station (CFA)

Background

This is an overview of the investigation into a grass fire that started around 1500 hrs on 21st January 2014 alongside Bridge Inn Road in Mernda, a developing suburb to the north of Melbourne.

The fire burnt 79Ha of grazed undulating improved pasture with a 6km perimeter under a strong southerly wind, temperature at the time was around 21°C and 44% RH. It is not uncommon to have significant fires develop under southerly wind influences in this part of Victoria. Normally these will occur in the days following a hot day once the cold front has moved through from the west of the State. With little or no rainfall incorporated with the cold front fuels remain dry and the fires when started are significantly influenced by the strong southerly winds.

The Mickleham-Kilmore fire that burnt over 23,600Ha and ran over 40km in length in March 2014 is an example of the potential of rapid fire spread in grass fuels under low temperatures and high humidity (refer Fig.1).

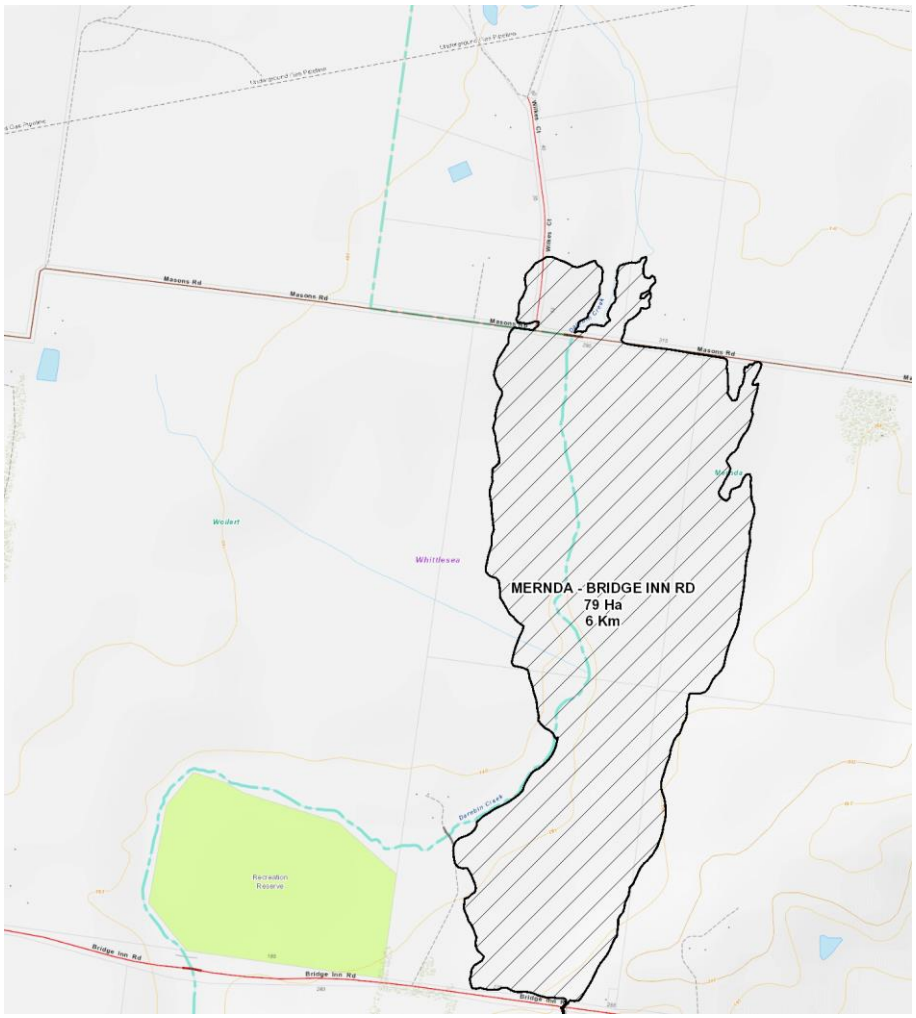

Fig. 1 overview of fire area

The scene examination

The investigator arrived on scene while the fire was still being actively fought, wind speed and direction was still as noted above and the fire was being contained with aircraft on the northern edge using a roadway as a control line. Victoria Police had closed the roadway due to the fire and detectives were on scene as there had been a number of deliberately lit fires along roadways in the area in recent times and it was thought that initially that this was another case of roadside arson.

Fig. 2 Firefighting activity still underway north of Bridge Inn Road

Finding an entry point into the fire ground close to southeast corner of the fire it was soon obvious through fire spread indicators that the fire had started on the south side of Bridge Inn Road, spread over the road by wind driven spotting from elevated fuels and continued to spread northward (ref Fig.2).

Having tracked the run of fire back to the roadside edge I was able to determine where the fire had crossed the road and burnt with low intensity downslope and then run through the paddock grass fuels spreading rapidly to the north.

Determining that the fire had spread from the south side of the road I commenced a scene examination using the road as an entry point, as with most roadside fires the area was littered with debris thrown from passing vehicles (refer Fig.3).

Fig. 3 Location where fire crossed road to the north (looking north west). Note unburnt shrubby fuels and grass

Part of the investigation time was taken up having to exclude potential causes such as cigarette butts where fire spread indicators did not support the possibility that they may have contributed to the cause of the fire.

An example of this is included (refer Fig.4). This cigarette butt was excluded due to the unburnt fine fuel in close proximity to the butt itself and the lack of any fine ash from the cigarette itself.

Fig.4 Cigarette butt found on south side of Bridge Inn Road

The area of origin

The area of origin was determined following the fire spread indicators that showed backing fire in the grassy fuels in the paddock to the south of the roadway (refer Fig.5) and head fire running upslope from the culvert / drain.

Fig.5 Area of fire origin on south side of Bridge Inn Road

The point of origin

The point of origin was determined following fire spread indicators, Figure 6 shows the point of origin. *Note the fallen grass stems along the fence line showing backing fire against the prevailing wind and the stem freeze in the grassy stems on the upslope.* In the centre of the picture is a metallic object.

Fig.6 Point of origin on south side of Bridge Inn Road

The metallic object

The metallic object was suspected of being the cause of the fire due to the appearance of the object itself. It has obvious signs of friction heating from contact with a rotating shaft that had ran through the centre of it. The object also showed no sign of surface rusting which would be expected from a ferrous based metallic object that had been heated to the point of softening and then exposed to the elements of weather. From this I concluded that this was most likely the cause of the fire but I was at a loss as to what the object was.

Fig.7 Metallic object found in area of fire origin

I suspected that the metallic object was part of a machine, most likely a vehicle that had been travelling along the roadway just prior to the fire starting. Having spent time with the Victoria Police Forensic unit as part of CFA's fire investigation course I was aware that the forensic unit had highly experienced vehicle examiners that may be able to assist in identifying the metallic object.

I made contact with the Detectives from Mill Park CIU that were still on scene and handed over the object suspected of starting the fire so they could pursue this line of inquiry.

Some weeks later I was advised that vehicle examiners had identified the object was part of an electric clutch mechanism that is typically found on the front of automotive air conditioner compressors.

Fig.8 Metallic object found in area of fire origin

Observations

There are many roadside start fires in the rural environment that are left with cause being undetermined due to scene disturbance during firefighting operations and the large amount of debris that exists along road verges.

Using the principles of following runs of fire using spread indicators back to a point of origin and then identifying the fuel, the ignition source and the event that brought those two together I was confident that the cause of the fire was the catastrophic failure of the air conditioning compressor.

Without the experience of working at the Victoria Police Forensic Science Section I would have been blind to the level of forensic support available to field investigators. When you suspect what the cause of the fire is but you don't know what 'it' is the technical support available through Police forensic examiners, gas and electricity agency experts, other technical experts can be the final piece of the puzzle needed to be confident to state what the cause of the fire is most likely to be.

Arsonists Extinguished

EDITORIAL MARIA CARNOVALE
Courtesy PoliceLife June2011

IT STARTED OFF AS BULLYING AND TEASING, THEN ESCALATED TO AN ACT THAT RISKED A MAN'S LIFE.

A group of five young men started a fire that changed a man's life.

Irving Richard Plotkin is better known as 'Smokey' in the seaside town of Rosebud. He is a well-known identity in the area, described as friendly, well-natured, and someone who keeps to himself.

So, when he became the target of taunts by a group of young men, and later became the victim of arson in his own home, the small community was outraged.

Late on 30 September, 2008, petrol was thrown into Mr Plotkin's home and set alight, leaving him with 46 per cent burns to his face and body.

Mr Plotkin's life changed dramatically and he has not returned to Rosebud since.

The Arson and Explosives Squad's Detective Acting Sergeant Scott Barnes said members of his team and those from the Homicide Squad were called to the scene of the fire.

"When we got there, there was a high probability that he was going to die. He had very serious burns," he said.

As police began their investigation, they called on the community for information, which led them to five young local men – Jamie Dingle, 19, Richard Findlay, 20, Tyson Jessen, 18, Allan Walters, 20, and Adam Taylor, 18.

It was found the group had a history with Mr Plotkin. Police were told Dingle had once tried to set his beard on fire and it was discovered they had filmed and placed a video online of the group pouring a tub of cream over Mr Plotkin's head.

Mr Plotkin had a vagrant appearance with a long beard, and would often ask locals for cigarettes.

"He would walk the streets at night, but no one had a problem with him, he was harmless. These guys seemed to have a bee in their bonnet about him," Det A/Sgt Barnes said.

On that night in September, the group's taunts turned dangerous.

The group drove around Rosebud for a short time before Dingle suggested they go to Mr Plotkin's home and set fire to his front door.

"They parked around the corner from the house and started to creep across. Findlay and Taylor went to the front door and one of them said 'Richard, it's Constable Smitty from Rosebud police'," Det A/Sgt Barnes said.

"Constable Smith is a police member at Rosebud who's had a lot of dealings with the kids, so they probably used his name because he was someone they didn't like.

"When Richard went to the door, they threw the petrol. It splashed onto the door and on the victim. Then they ran back to the nature strip and started talking about who was going to light it."

After a few attempts to start the fire, Findlay and Jessen used a container of petrol to make a Molotov-like cocktail and throw it at the house, reaching the spot where Mr Plotkin was standing.

"They all ran away and made no effort to help. Richard jumped out of the window on fire and a neighbour, who was a nurse, came out and treated him as best she could until the ambulance arrived," Det A/Sgt Barnes said.

"His burns were so horrific that she didn't know who he was at the time."

As police investigated, the evidence against the five young men strengthened.

A forensic chemist conducted a soil test around the house, confirming an accelerant was used and that the fire was arson.

"We appealed for witnesses and were fortunate enough to find Oli, a friend of the group, who saw them just after the fire occurred," Det A/ Sgt Barnes said.

"They pulled over to give Oli a lift, but he made a comment about the car smelling like petrol, so they drove off on him.

"We got a few information reports from people telling us the boys were skylarking about how they had burnt him, and there were some messages on MySpace where one of the boys talked about setting fire to a house."

Witnesses also came forward saying they had seen the group at a petrol station in nearby Dromana earlier that night.

A witness claimed the offenders said they were going to "burn a smoke", which police believe was a reference to Mr Plotkin's nickname 'Smokey'.

Det A/Sgt Barnes said Jessen was the first of the group to be arrested and initially denied the offences. He later changed his story, saying it was a prank gone wrong.

The other four young men made similar admissions when they were arrested and interviewed.

"Taylor was talking about going shopping later and didn't understand the ramifications of his behaviour, that he was likely not to go home that night," Det A/Sgt Barnes said.

"Dingle, who I believe was the ringleader, was cavalier about his impending remand and asked me if there was a gym at the police station that he could use.

"They were all oblivious to the severity of the consequences of their actions."

The group later plead guilty to criminal damage by fire (arson) and reckless conduct endangering life.

All five were assessed by the court as being suitable for juvenile justice detention. However, Judge Barbara Cotterell determined an adult prison environment was most appropriate.

Jessen, Walters, Findlay and Taylor were sentenced to a maximum of five years with a minimum of three.

Dingel was sentenced to a maximum of five years with a minimum of 2 ½, due to him having an acquired brain injury.

Victoria's Adult Parole Board later reversed Judge Cotterell's decision and, upon application, Walters, Dingle, Jessen and Taylor were transferred to a youth justice centre for the remainder of their sentence. Findlay did not apply.

Mr Plotkin sustained a broken wrist, fourth degree burns to 50 per cent of his body and his eyelids and lips had to be removed. He has received numerous skin grafts and will need rehabilitation and surgery for the rest of his life.

His home was also completely destroyed.

"I personally couldn't understand how young people could do this to someone. They were bored and they picked on him because he was vulnerable," Det A/Sgt Barnes said.

"I think the successful outcome of this investigation was largely attributed to assistance and public outcry from the Mornington Peninsula community, who were deeply affected by this stupid act, and the dogged attitude of a core group of investigators at the Arson and Explosives Squad."

AAFI 16 - Attendance report

Station Officer Michael Rowell (CFA)

115 delegates from Australian and New Zealand including around 15 from Victoria (VAFI) members travelled to Coogee, Sydney for a 3 day AAF1 2016 conference in September.

The Conference consisted of a one day workshop at the FRNSW FIRU Research facility at Londonderry (60kms West of Sydney CBD) where the delegates had the opportunity to examine two fire scenes created by Steve Carman (US) the week before. Two live flashover demonstrations were also presented.

The following two days of conferencing was held at the Crowne Plaza Coogee.

Keynote speaker Steve Carman from the USA made multiple presentations and presented numerous videos to show the effects of ventilation and elevation on fire development along with discussing his findings and understanding of post-flashover and fully involved fire. He also made available for viewing footage taken during the test burns at Londonderry the week prior.

Some 13 other speakers presented sessions over the two days on topics ranging from new fire science trends/aids to assist in fire investigation through to the self-heating tendencies of animal and vegetable oils.

Many case studies were also presented, some highlights were:

- The collegiate approach of multiagency investigation into deliberate fires.
- A NSW Police Arson Unit investigation into a serial fire lighter from the FRNSW.
- A presentation on the ammonium of nitrate transportation fire and explosion in QLD.
- Our own VAFI delegate CFA Operations Officer John Cutting presented his investigation into the Kangaroo flats Church fire.

Another highlight was the attendance of the NSW State Coroner Michael Barnes who participated in an open panel discussion on expert witness testimony in the courts.

The networking function held on the second night gave delegates the opportunity to mix with colleagues from around Australasia in a less formal environment with a comedian on hand to entertain and awards presented. This was a great opportunity to reacquaint or make new acquaintances – overall an enjoyable night. No doubt that enjoyment was not felt by some the following day however.

The AAFI 2016 Conference theme was '*The Learning Is In The Burning'* and really highlighted the importance of live burns in fire research and investigation, along with gathering evidence for further actions in prosecutions and improvements in safety requirements.

Overall a very informative and educational few days; no doubt thoroughly enjoyed by all.

Queensland Association of Fire Investigators

Presidents Report

The QAFI has undergone a change in presidency in the past 12 months.

In my first communication as new president I would like to acknowledge the leadership and guidance provided by past president Gordon Hemphrey for the past 4 years.

Gordon remains active in the field of Fire Investigation as the current State Manager of Queensland Fire and Emergency Services (QFES) State Fire Investigation Unit based in Brisbane and this network has proven to be a beneficial link for the QAFI in past Live Fire event training days. The QAFI intends to maintain this strong connection for future training events.

I would like to state it is my clear intent to maintain the high standards set by Gordon during his presidency and to promote the development of new learning and advancements in the theoretical understanding and demonstrated practices for all facets of Fire Investigation across our Australian and New Zealand IAAI Chapters and networks of Investigation agencies.

I would like to congratulate the NSW AFI for their recent delivery of the national AAFI Conference in Sydney in September 2016. The conference was well attended by a diverse range of industry professionals and the standard of the presentations was very high.

Steve Carman provided a set of clear and concise information sessions that were well aimed and delivered for the target audience. Steve's presentation skills and personal style was conciliatory to the fire investigation knowledge and skills already present within the room and his sense of humour was well received.

Many of the sessions delivered during the conference provided great background information of cause determination analysis protocols and confirmation and review of best practices.

The standout session of these was in my opinion the expert panel who provided their free advice on a range of matters relating to Fire Investigation. I again offer my sincere congratulations to the NSW AFI team for the delivery of the 2016 Conference.

Any Fire Investigator irrespective of their agency representation must always be prepared and have a demonstrated capability to defend and define the manner in which they have processed a fire scene, conducted their investigation analysis activities and developed their final hypothesis on the origin and cause outcomes.

With these themes in mind the QAFI has determined to make every effort to bring the highest available levels of educational and informative value to our future training presentations. We acknowledge that there is a requirement for all Fire Investigators to be able to display a level of recognised competence in their field.

While the QAFI is not in a position to offer any formal training qualifications as an outcome of our training events and seminars, we intend to maintain the highest standards of presenters and industry experts to ensure any delegates who are able to attend our training events, receive the latest information, advice and exposure to contemporary best practice protocols for fire investigation activities.

This QAFI routinely runs three information sessions each year, a breakfast seminar(1-2 hrs) a half day seminar and a full day or two day seminar " Live Fire "event every second year. These training dates run approximately every three months, dependant on seasonal variations and availability of venue.

With the focus on information, contemporary methodology and developing investigative trends the QAFI ran a breakfast seminar in March that reviewed changes in contemporary firefighting techniques. This session reviewed the improvements in understanding of fire scene preservation through increased awareness and training for frontline suppression crews.

It also highlighted developments in suppression technique such as compartment gas cooling to gain control over the developing fire plume and the required shift in scene preservation focus once initial containment had been achieved.

The ability of a fire crew operating under duress within a working fire scene to recognise the change in fire development and to shift their focus from fire suppression to fire scene prevention is a vital cog for the success of any future fire scene investigation within that site.

The July half day training event focussed on emerging issues in battery systems and the processes required to initiate product recall.

The QAFI sourced some industry specialists from across the country who provided design and development changes in Electric Vehicles and Lithium Battery safety and identified the primary risk to a fire investigator in assessing fire involving these type of products.

An information session on recent investigations into fire events involving self-balancing scooters (so called "hoverboards") many thanks to Inspectors from Energy Safe Victoria for this presentation, we also had a before and after fire event "scooter" sample for delegates to view (shrink wrapped for contamination safety of course)

To round out this training event we had a representative from the Office of Fair Trading explain the processes and protocols required to initiate a product recall under Australian Consumer Law and a Legal Representation on the potential insurance implications for any person who knowingly continued to use a recalled product.

Maintaining awareness of developing trends and recent technical changes in available products remains an important part of any fire investigators tool kit of knowledge.

The final QAFI seminar for the year was a half-day session scheduled for Dec 1 and was a review of the organisational responsibilities and the rights of access of the various agencies involved in a fire scene from Incident notification to site rehabilitation.

Representatives from Queensland Fire and Emergency Services discussing incident notification, QFES Intervention, QFES authority at a fire incident and suppression activities, Queensland Police Service, discussing Crime scene classification, QPS Authority at an incident, evidence removal and release of scene, a Legal Representative explaining jurisdictional access to the incident type, public liability and legal obligation to site rehabilitation and Insurance and Public Health representatives explaining all facets of a fire investigation

I look forward to welcoming any delegates from any jurisdiction who may be interested to attend any of the QAFI training events for 2017. QAFI will broadcast a 2017 Training calendar early in the New Year.

Kind Regards

Chris Markwell
QAFI President

NSW Association of Fire Investigators

Presidents report

Season's Greetings

NSWAFI has completed a very successful year. The AAFI conference was held in September and it was a huge success with 115 delegates from all over Australia and New Zealand. I feel that all the delegates gained a lot from the conference especially from Steve Carman. Training for fire investigators is hard to come by in Australia and New Zealand so it was great to see so many from our industry passionate about their professional knowledge development. The organisation of the conference was good enough that we were able to return a profit. This has ensured the future viability of the bi-annual conference. NSWAFI will contribute money from the profit into the seed funding for the 2018 AAFI Conference to be held in Victoria. I hope that you can support this conference as much as our conference this year.

We have conducted five education nights this year, one less than normal due to the conference. Next year we are planning six education nights with the first being Thursday 2/2/16. This education night will focus on the importance of NFPA 921 and 1033. Next year, 2017, there will be a new edition to the NFPA 921, so this education night will be more important than ever. There is always changes to this document every 3 years and one education night next year will focus on those changes, but February will be a night that will focus on why fire investigators should be using these document to prepares themselves better in the investigations they conduct.

The other education nights will be Thursday 6/4, Thursday 1/6, Thursday 3/8 (AGM), Thursday 5/10 and Thursday 7/12. We are still panning what topics will be covered in these education nights, so if you have any ideas please contact Steve Apps (education@nswafi.com.au) with your thoughts.

Our membership continues to grow with over 160. Our new website is up and running with a number of features to make it easy for members to purchase merchandise, renew your membership or confirm your attendance at education nights. We have now set up our own PayPal account to enable easy purchase of items through the website. Our Facebook site has over 160 likes, which has been slowly increasing. Our YouTube site also continues to grow with more videos from the conference, and educations nights.

Congratulations to Ken Legat, President of FIANZ who obtained his CFI in September during the conference. He is now the 2nd person in NZ to gain this certification. If you have been in the fire investigation industry for a few years you may be able to apply for the FIT and/or CFI certifications. Please contact me if you are interested. More information about these programs can be found here:

https://www.firearson.com/Training-Certifications/Certified-Fire-Investigator-IAAICFI/Default.aspx

https://www.firearson.com/Training-Certifications/Fire-Investigation-Technician-IAAIFIT.aspx

I thank you for the time spent reading this message and being part of our association. I wish all a safe festive season, and best wishes for 2017.

Michael Forbes IAAI-CFI CFEI GIFireE
President

Articles

Fire Investigators Conference held in Australia

Australasian Association of Fire Investigators - AAFI 2016
By Ross Brogan AFSM, MA, IAAI/CFI

The Australasian Association of Fire Investigators is made up of multiple chapters, New South Wales (NSW - NSWAFI), Queensland (Qld. - QAFI), Victoria (Vic. - VAFI) and New Zealand (NZ – FIANZ); all chapters of the International Association of Arson Investigators (IAAI), which has over 80 chapters across the world. This conference is held every two years and rotates between chapters throughout Australia and New Zealand, presenting participants with an opportunity to participate in world-class fire investigation education. This year the conference was the peak biennial forum for fire investigators, with attendees from all states of Australia, New Zealand, United States and Hong Kong; attracting Police, Fire Service, Loss Assessors, Insurers, Legal Professionals, Private Investigators, Forensic Practitioners and varied members associated with fire investigators and fire investigation. There were 115 attendees.

In 2016 it was the NSW Chapter that conducted the conference at the Crowne Plaza Hotel in Coogee (Sydney), between Monday 12th September and Wednesday 14th September. In 2014 the conference was in Melbourne and in 2012 Brisbane, Queensland.

The aim of the conference is to promote education within the industry by encouraging practitioners to learn through testing and experimentation. The conference provides an opportunity through networking and education, to work together across a range of disciplines and jurisdictions, to share experiences and the latest innovations and techniques to develop more effective fire investigation methodologies. The theme of the conference was ***"The Learning is in the Burning"***. The guest international keynote speaker was Steve Carman, from the United States, a world leader in fire investigation training. This was a unique opportunity to learn from one of the best in the industry.

The Monday started at 0700 hours with bus transport to the Fire Rescue NSW (FRNSW) test burn facility at Londonderry (an outer Western suburb of Sydney), for all participants. Several structural burns were conducted during the day, overseen by Steve Carman. All burns were photographed and videoed for later presentation to the conference attendees. Test burns were allowed to progress to 'Flashover' and then extinguished to obtain maximum value from the burn.

Tuesday began at 0830 with the official conference opening by (Acting) Commissioner of FRNSW, Jim Hamilton. Steve Carman presented on ***"Understanding the behaviour of***

post-flashover and fully-involved fires" with reference to some of the test burns conducted on Monday and showing how burn patterns remain after fires and can be interpreted by the investigator. He continued with a presentation on the impact of ventilation on structure fires and how burn patterns can be affected by that ventilation.

The next presenter was this author with a discussion on the use of National Fire Protection Association (NFPA) Standard 1033 ***"Professional Qualifications of Fire Investigator"*** and NFPA 921 ***"Guide for Fire and Explosion Investigation"***, the current trend towards the gaining of qualifications, and the necessity to do so. It was also recommended that a standard methodology, such as the "Scientific Method" be employed each and every time an investigation is conducted, for consistency and to display a professional approach to the endeavour. A further presentation with information on fire investigation degree courses available through Charles Sturt University in Australia ensued.

Michael Holohan, a Barrister and ex-Police Forensic Officer, discussed what constitutes an 'Expert Witness' and emerging trends in the presentation of expert evidence. Michael is a Barrister that specialises in fire matters. This was followed by Stuart Ritchie, also an ex-Police Forensic Officer, now in private practice, talking on the value of using a collegiate approach to investigations and the interaction between agencies and individuals that should occur at fire scenes.

The final session of the afternoon was completed with a panel of experts answering questions, both from a moderator and from audience participation. The panel comprised experts such as Steve Carman, the NSW State Coroner (Michael Barnes), a Detective from the NSW Police Arson Unit and others from the conference programme. The theme of the discussion revolved around evaluating expert evidence from a court perspective.

Part of the audience at the AAFI2016.

Tuesday evening involved a Networking function that allowed presenters and audience members to interact over a drink and refreshments and to discuss matters that had been brought up during the conference so far. It also allowed colleagues, old friends and new to explore old times and discuss new investigations that have shown to be worthy of discussion.

Wednesday morning started with a case study of a large church fire that had occurred, showing how the scene was approached and how the many agencies involved interacted to reach a conclusion on the origin and cause of the fire. A case study followed showing how a serial fire lighter was brought to the attention of authorities, tracked and evidence gathered to finally arrest and convict him of many fires lit for his personal monetary gain.

Further into the day technical presentations concentrated on the availability and use of a portable Gas Chromatograph/Mass Spectrometry (GC-MS) at fire scenes, specifically regarding compressed air foam application at fires. This was followed by a presentation of the self-heating tendencies and prevalence of animal and vegetable oils. That presentation was particularly enlightening for those involved with fires suspected of starting by spontaneous combustion and involving oil of some kind; with information on how that can be proved by laboratory tests.

Steve Carman presented his latest testing on fires elevated above floor level and the peculiar way that they behave compared to current knowledge of fire behaviour from floor level fires. This information was particularly interesting as it showed how different the behaviour was that was expected from all fires and how the elevated fire can present evidence that may confuse the investigation.

Steve Carman (left) and Michael Forbes (President NSWAFI)

Video was shown of actual test fires that provided evidence that would challenge current thinking on how fires behave and the artefact evidence remaining would challenge the investigator in an endeavour to determine the origin of the fire and how the fire spread from that origin.

The final session contained a case study of a fire and explosion that occurred involving a truck carrying Ammonium Nitrate in an isolated part of Queensland that caused extensive damage to both the truck and two fire engines attending the scene, with many serious injuries that resulted from the explosion. A road and a rail bridge were destroyed and the incident involved many players, over an extended period to

investigate and reach a conclusion. This was presented by Gordon Hemphrey, Manager of fire investigations for the Queensland Fire Service and President of QAFI.

Greg Kelly (ex-Police Forensic Officer) tabled a presentation on the use of Arc-Mapping at fire scenes and the value of such a procedure to the investigation. He spoke about the Australian/New Zealand electrical wiring rules and how they can be utilised to obtain the best value from the arc mapping process.

The consensus at the conclusion of the conference was that the aim of promoting education, and the value of conducting tests, was successfully reached and that the conference overall was a great success. Final closing remarks were delivered by Michael Forbes (President NSWAFI) thanking his conference team, wishing everyone a safe journey homewards and expressing his view that he should see everyone again at the AAFI conference in 2018, possibly held in New Zealand.

For more information regarding fire investigation training/education and the Association of Fire Investigators/IAAI (www.firearson.com) contact your local chapter of the Fire Investigators Association (details within the Firepoint magazine).

Biography - Ross Brogan

Ross Brogan was in the NSW Fire Brigades for almost 38 years and in the Fire Investigation Research Unit for 16 years. He retired in 2007 as an operation Commander overseeing 15 fire stations.

He is a life member of the NSW Chapter, member of the IAAI and member of the IAAI Fire Investigator Standards Committee (FISC). He has worked for Charles Sturt University coordinating and teaching Fire Investigation Degree studies since 2002.

Fire Investigators Association of New Zealand

Presidents Report

Welcome to the latest edition of FirePoint.

Since the last publication a number of our members attended the very successful Australasian Association of Fire Investigators conference in Sydney.

The topics and presentation by Steve Carmen was well worth the effort for those that attended. We look forward to the next conference in two years' time in Victoria.

At the conference the various chapter presidents met and agreement was reached in formalising the AAFI and Firepoint magazine, as with all things it is taking time to finalise but the various chapters are in contact and we hope to have it finished in 2017.

On our return to New Zealand the FIANZ board found that the government had drafted a new bill for the New Zealand Fire Service.

The bill was a result of a review of New Zealand's fire services in 2015. The review found that the current structure is out of date and doesn't match the work fire-fighters do.

The proposed bill would see a new organisation, Fire and Emergency New Zealand (FENZ), look after all fire services across the country. FENZ would bring together volunteer, professional, urban and rural fire-fighters who currently work under different agencies into a single national fire service to look after all fire services across the country.

At the moment NZ fire services are provided by professional and volunteer fire-fighters from different organisations. The New Zealand Fire Service looks after urban areas 52 Rural Fire Authorities look after rural areas

The major emphasis was on the fire service levy people pay on insurance (for contents, property and motor vehicles) being the main source of funding for Fire and Emergency New Zealand.

The levy will replace a variety of funding sources for rural fire services, such as local government and the Department of Conservation.

If passed into law, the fire levy will be included on insurance for material damage, not just fire damage from July 2018.

However the FIANZ believed it was necessary to comment on the proposed bill on behalf of our members so there was a urgent amount of contact with members to draw together the views of all our members as the Bill makes no mention of importance of investigation to determine possible origin, cause, and liability for the occurrence of fire but referred to "post incident analysis "

At the conclusion of the consultation with our members a FIANZ submission was approved by the board and submitted to the select committee.

Both Peter Gallagher and I presented to the select committee and we believed we had a good reception.

We recommended the following

- that FENZ adopts the current edition of National Fire Protection Association documents NFPA 921 Guide to Fire and Explosion Investigations as a standard practice guideline and NFPA 1033 Standard for Professional Qualifications for Fire Investigators as a method for qualifying New Zealand fire investigators to internationally recognised standards.
- That the Fire Investigation protocol developed between the Insurance Council of New Zealand and New Zealand Fire Service and signed in 2010, be the basis of the specific regulations for Fire investigation regulations.
- That the select committee gives serious consideration to the drafting of specific regulations for fire investigations. Such fire investigations regulations may include the following broad headings:
  - Appointment of recognised qualified fire investigators.
  - Authority to conduct fire investigations.
  - Definitions of interested parties.
  - Professional conduct.
  - Duty to cooperate.
  - Duty to confer.
  - Provisions to prevent spoliation of evidence.
  - No party to be disadvantaged.
  - Full and meaningful cooperation between all parties.

A full copy of the submission can be found at https://www.parliament.nz/en/pb/sc/submissions-and-advice/document/51SCGA_EVI_00DBHOH_BILL69468_1_A527844/fire-investigators-association-of-new-zealand-inc

The select committee has now finalised the submission and will be presenting the bill for a second reading in 2017, at this stage we have no idea if any of our submissions will be taken into account. However the final act is drafted FIANZ will have to deliver training to our members to learn to work with the act.

Earthquake

As most will be aware there was a magnitude 7.8 (Mw) earthquake in the South Island of New Zealand that occurred two minutes after midnight on 14 November 2016.

The ***'Kaikoura earthqu***ake' ruptured on multiple fault lines in a complex sequence that lasted for more than one minute and has damaged significant parts of North Canterbury, the tourist town of Kaikoura and the capital Wellington.

Our thoughts are with our members in the affected areas.

FIANZ can be contacted at either, admin@FIANZ.org.nz or by using the contact form on the FIANZ website http://www.fianz.org.nz/

Or by mail to:

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Trailer fires involving metal to metal wear:

Recently I have been involved in the investigation of three fires involving freight trucks and trailers whilst in long haul transit with two of the fires involving trucks from the same trucking company occurring in quick succession.

General view of mezzanine floor attached to metal bracket with freight stacked in close proximity.

All these fires showed a consistent pattern of originating in the rear trailers, in corners where the metal frame of the mezzanine floor fitted into metal brackets.

As part of the investigations, interviews were conducted with the drivers and loading staff. Along with information from a trailer manufacturer, a list of possible causes were considered.

These were:

- Accidental –activities while loading;
  This cause was eliminated in each case due to the fires occurring often hours after leaving the depot.
- Accidental – chemical reaction;
  There appeared to be no evidence of chemical spills in all incidents.
- Accidental – electrical event;
  This cause was considered with no evidence found in the freight or the trailers.
- Accidental – friction of mezzanine frames;
  The mezzanine decks are held up by metal bracket in each corner of the trailer. Close examination of the four 'U shaped' brackets on the trailers had identified wear damage to all of them, with the worst being in the corner where the drivers had first noticed the fire in all three cases. In discussions with one of the loaders he stated that he had seen wear debris inside trailers when unloading at the depot.

After consideration of the above causes and the elimination of the first 3, we concluded the most likely cause of the fires was movement of the metal framed mezzanine floors in the corners where they were fastened to the trailers. Close examination of the brackets that held the mezzanine floors in the corners and the metal components of the mezzanine floors identified extensive wear to the metal consistent with metal to metal contact causing burring and wear. The brackets that held the mezzanine floors were removed by the investigator for further examination. These were closely examined for evidence of burring and wear. They all showed extensive damage consistent with being subjected to this.

Close up of the bracket and block on a mezzanine floor showing metal to metal rubbing and wear.

This movement has resulted in metal to metal rubbing at the brackets in the four corners of the trailers whilst in transit causing friction and wear, producing hot particles of metal (wear debris) to drop down and ignite combustibles in the form of freight within close proximity to the corners.

Trailer manufacturers supply chains with their trailers as the securing practice of the mezzanine floors to prevent movement during transit, however, due to challenges with using the chains, the truck operators had been substituting the chains with fabric strops which we believed was allowing the movement to occur.

Recommendations were made to the trucking company involved in two of the three fires to minimise the risk of these fires reoccurring. These recommendations were that the mezzanine floors be tied down with chains (as per the manufacturer's recommended method) rather than the fabric strops that had been used. At the time of writing this article the company has not had any more incidents.

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Investigate the Origin and Cause of Wildfire (level 2)

November 7th 2016 saw 13 people gather in Christchurch for a week long Rural Fire Investigation course, participants were from both Rural and Urban Fire services

The course was organised by the National Rural Fire Authority (NRFA) with the instructors from across the south Island, John Foley (Marlborough Kaikoura RFA), Elton Smith (Southland RFA), John Barnes (Contractor), Graeme Still (Otago RFA) and Russell Barclay (NRFA)

During the week each day started with theory and background information for the afternoon practical sessions where live burns were observed and older burns investigated to identify origin and cause.

These sessions covered, were why we investigate Wild Fires, Fire Behaviour, Burn Pattern Indictors, Systematic Methodology, Photography and Documents, Ignition Factors and Sources, and Scene Examinations

The practical exercises started with simple flat grass burns and finished with some very testing fires in a gorse block.

Neil Kitchen of Nelson Police took the group through court preparation and testimony on the Thursday as how to carry out interviews where he gave the group a number of tips and building blocks to work with.

Friday saw the completion of a Fire investigation report which was compiled from information collected over the week and then a 90 minute theory assessment.

When the participants are deemed confident at this point they are required to complete a level 2 Wild Fire investigation in the field and submit a report to the instructing panel for consideration before they are awarded the unit standard 10615 and deemed competent to hold the qualification for a Level 2 Wild Fire Investigator with the NRFA.

Day 1 - Observing grass fire behaviour

Day 2 Fire investigation of a 3 day old site

Day 4 – The gorse block fire investigation

Detection of flammable liquid residue at the scene of fire by a hand held photoionization detector (PID)

Report Prepared by
Senior Specialist Fire Investigator Peter Gallagher
Date: 24th August 2016

Abstract

The identification of the ignitable liquid residue at the scene of a fire is one of the critical tasks of the fire investigator. In recent times the development of handheld portable photoionization detectors (PID) has provided a field deployable screening tool to allow better recognition of areas where samples may be taken for forensic analytical laboratory analysis.

With little available literature available to determine the persistence and decay of Volatile Organic Compounds (VOC's) present at a fire investigation scene a series of tests were undertaken with a using a range of sample quantities of petrol on a variety of surfaces in both post-fire and non-fire environments. Measurement ranges varied from tens of parts per million (ppm) for initial samples to only tens of parts per billion (ppb) at the conclusion of the testing some 56 hours after deposition.

The results of these measurements show an approximate linear decay rate over time which is consistent with the evaporation of the volatile components of the sample and indicate that a PID with a resolution of parts per billion is suitable for detection of VOC's on non-porous surfaces post fire.

Additionally the concentration of discernible VOC's is greatly reduced if the sample is non-porous and degraded by weathering or by exposure to high temperatures.

Introduction

Fire investigators in New Zealand routinely use photoionization detectors for the detection of volatile organic compound reside at the scene of a fire to assist in establishing the probable cause and origin. The purpose of this study is to determine the benefits or otherwise of the resolution of the photoionization device and to examine what impact a delayed investigative response to the fire scene would have in affecting the ability to accurately locate the presence of VOC's.

Methods and Materials

To determine the amount of hydrocarbon liquid to be used a series of tests were undertaken using water to establish the approximate amount which was ejected from a standard 1 litre plastic bottle when the bottle contents were thrown from the bottle. The amount ejected was collected and measured resulting in a value of approximately 1 ml/cm2 on an impervious surface. This value was then applied to each sample based on the surface area of the sample in cm2 determining the quantity of liquid to be used. Three distinct sample batches were established.

***Sample Batch** 1 consisted of samples exposed to the weather and consisted of the following:*

A. 36 ml of petrol poured on concrete.
B. 36 ml of petrol poured on vinyl floor covering glued directly to concrete.
C. 36 ml of petrol poured onto mown grass.
D. 36 ml of petrol poured on mown grass and ignited.
E. 36 ml of petrol poured on gravel.
F. 36 ml of petrol poured on gravel and ignited.

Nb. All of these fires burned to extinction with no extinguishment added.

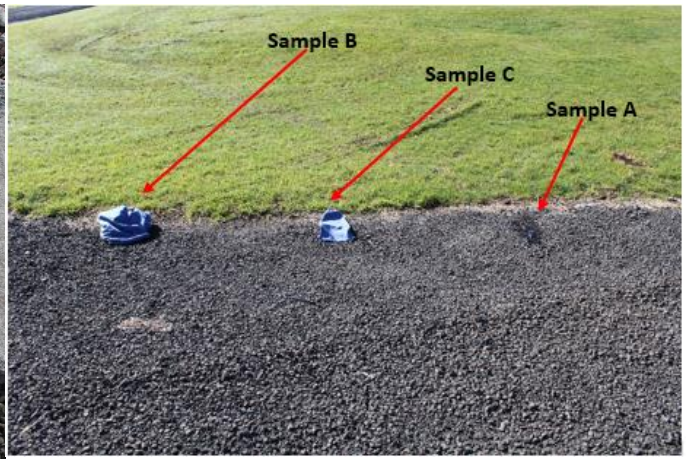
***Sample Batch 2** consisted of 8 samples established in a sparsely furnished room and subsequently the room was allowed to transition to post flashover full room involvement. The samples were located in close proximity to the main energy source, a two seater couch.*

A. 50 mls of methylated spirts was poured on the left seat of the couch.
B. 50 mls of kerosene was poured on the right side seat of the couch.
C. 5 mls of petrol was poured on to the carpet.
D. 10 mls of petrol was poured on to the carpet.
E. 50 mls of petrol was poured on to the carpet.
F. 36 mls of petrol was poured on to a glued vinyl floor covering.
G. 36 mls of diesel was poured on to a glued vinyl floor covering.
H. 36 mls of petrol was poured across the join in two pieces of 19 mm particle board.
I. 40 mls of petrol was poured over a tongue and groove wooden flooring sample.

Sample batch 3 consisted of 3 samples involving brushed cotton clothing:

A. 20 mls of petrol was poured onto the fabric ignited an allowed to burn out.
B. 10 mls of petrol was placed on the fabric and it was left to weather.
C. Control sample of fabric spayed with a deodorant only.
D. Each set of samples was left undisturbed and scanned at various intervals ranging up to 56 hours.

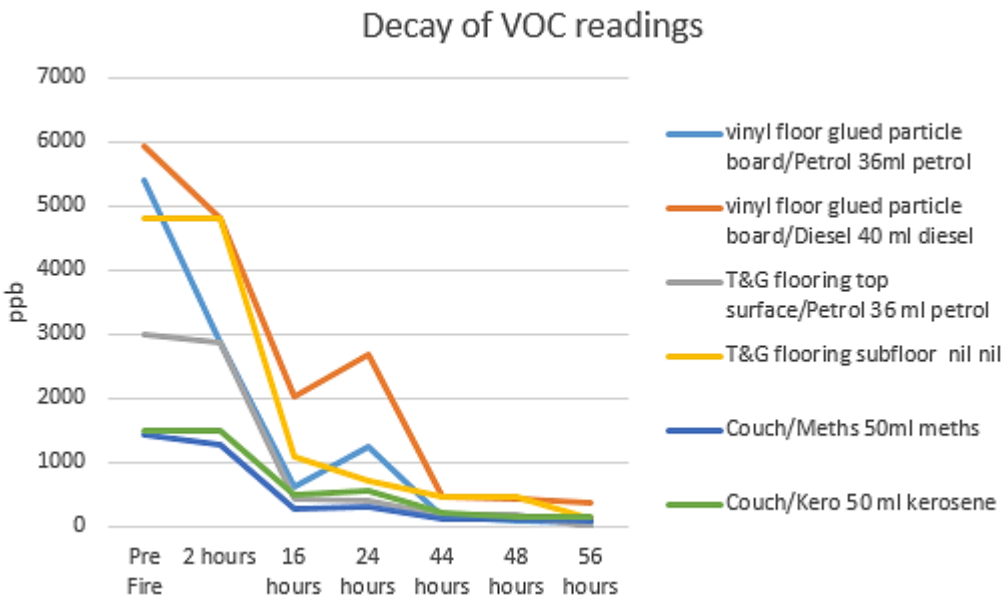
Sample Batch 1 samples A and B

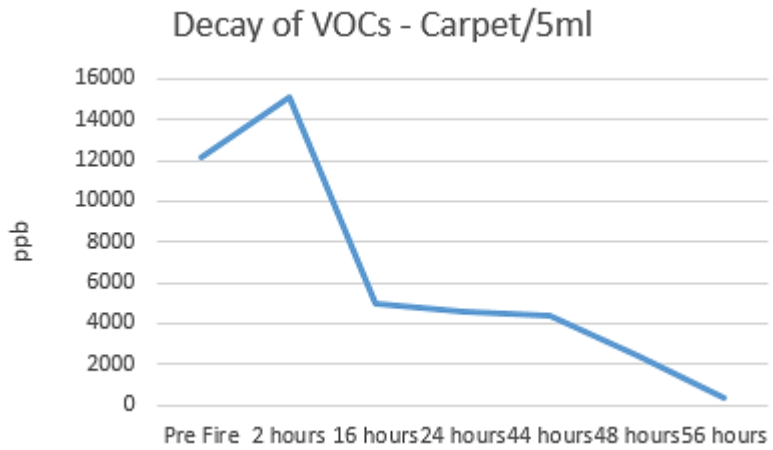


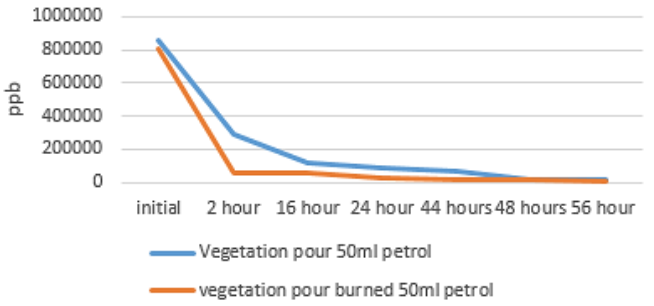
Sample batch 3

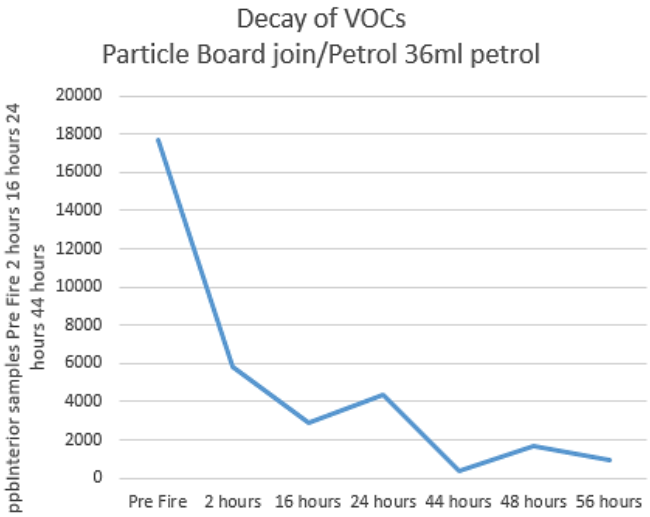
Results

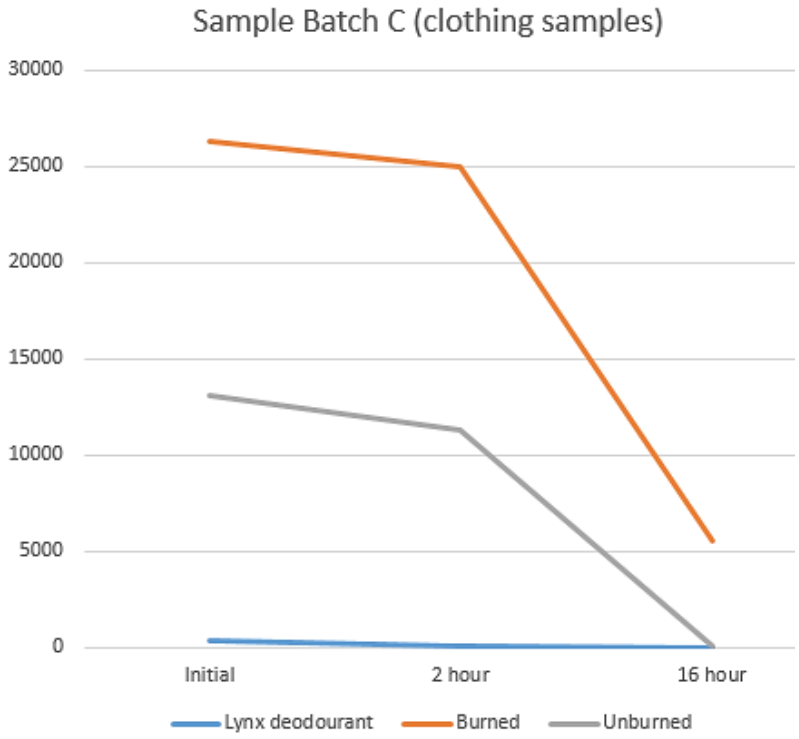
Initial readings were taken after approximately 1 hour as this time was understood to commonly be the earliest that a fire investigator is likely to be on scene and utilizing the PID. These readings therefore became the baseline measurements for later comparison. After a further hour had elapsed the samples were again re-examined with the PID. All samples exhibited elevated readings compared to an unaffected area used as a control sample. Progressively the intervals between measurements were extended to provide a comprehensive data set over the 56 hour period. The graphs presented below demonstrate the typical decay curves observed, tabulated results are included in in the following diagrams.











Forensic Analysis

After the 56 hour test period, sections of carpet from each of the 5, 10 and 50 ml samples and a control sample were uplifted and sent to the Government Forensic Science Service (ESR) for Head Space analysis using their Gas Chromatograph and Mass Spectrometer (GC-MS).

The report from ESR showed that after being subjected to flashover conditions and then left dormant for 56 hours, GC-MS was able to detect some components of petrol in the 5ml sample. However there were insufficient components present to determine whether or not petrol was present in this sample.

ESR were able to confirm the 10ml and 50ml samples as containing petrol. The control sample understandably had a negative result for petrol.

Notably, the tests also showed trace VOC's were still positively detectable by PIDs at ppb levels beyond the time period that GS-MS can positively identify a volatile organic compound.

Ignition in the middle of the couch. The relative position of other samples can be seen in the foreground

Discussion

The near linear decay rate for emitted VOC's is an expected relationship however the detection of VOC's by the ppb ionization detector versus the time period demonstrates the value that such instruments have in being able to identify extremely small quantities even after fire exposure and /or sample weathering.

This testing additionally demonstrated that the substrate is a significant factor in the longevity of the sample. In all tests, the substrate which was more porous offered the longest sample identification time. When considering the use of a PID for sample identification fire investigators should look towards porous materials for the highest degree of change over the background and therefore the most discernible sample.

It should be noted that these tests were conducted where known samples were located and the ability to recognize an area of random sample placement within the fire scene relies on the skill of the fire investigator to first identify the most likely locations for sampling.

Even in fire scenes where flashover has occurred the PID offers the fire investigator the opportunity to identify locations for further laboratory analysis. Given the decay rate over time, the most ideal sample time in all tested samples is within the first 3 hours post extinguishment. Ambient conditions of high humidity will also vary the accuracy of results thus requiring the use of a humidity control filter or a time delay between extinguishment and measurement.

In post flashover events the use of a PID with ppb resolution is capable of producing results enabling the further determination of the cause or the presence of a VOC. Investigators using portable PID instruments should assess the entire scene to establish areas where background VOC levels are exceeded.

It is not envisaged that the use of a higher energy lamp, with an ionization energy exceeding 10.6 eV, will significantly alter these results, rather that it would demonstrate a similar degradation curve as the primary issues around sample decay are more influenced by the sample volatility and the substrate on which the sample is located.

Appendix 1

temperature recorded 22 degrees Celsius	Size	Sample	Initial	2 hrs	16 hrs	24 hrs	44 hrs	48 hrs	56 hrs
Exterior Samples (Sample Batch A)									
Concrete exposed to weather	36ml	petrol	13600	2840	260	113	25	14	0
Vinyl glued to concrete exposed to weather	36ml	petrol	11860	1330	570	700	222	214	200
Vegetation pour	50ml	petrol	856000	292000	116400	85910	66500	20220	11470
vegetation pour burned	50ml	petrol	806000	55040	57530	28480	20070	19690	6621
Gravel pour	50ml	petrol	1497000	57060	35880	31290	20070	5939	1270
gravel pour burn	50ml	petrol	116400	11490	15010	9980	11180	233	211
Interior samples (Sample Batch B)			**Pre Fire**	**2 hrs**	**16 hrs**	**24 hrs**	**44 hrs**	**48 hrs**	**56 hrs**
vinyl floor glued particle board/Petrol	36ml	petrol	5414	2858	630	1239	150	98	46
vinyl floor glued particle board/Diesel	40 ml	diesel	5944	4814	2024	2682	475	435	371
T&G flooring top surface/Petrol	36 ml	petrol	2996	2858	447	395	199	173	0
T&G flooring subfloor	nil	nil	4823	4814	1079	704	456	464	130
Couch/Meths	50ml	meths	1446	1265	280	325	120	131	100
Couch/Kero	50 ml	kerosene	1509	1505	507	554	202	140	140
Particle Board join/Petrol	36ml	petrol	17700	5792	2920	4372	399	1703	966
Carpet/5ml	5ml	petrol	12140	15070	5008	4545	4393	2446	374
Carpet/10ml	10 ml	petrol	31340	22540	15890	10460	5416	5558	759
Carpet/50ml	50 ml	petrol	63550	99400	31560	21660	11820	13010	3100
Clothing samples (Sample Batch C)									
Deodorant			314	70	0				
Burned Clothing			26300	25000	5526				
Unburned Clothing			13100	11310	22				

Images of interest

AAF1 2016 conference