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PERTRONIC F220 Fire Alarm Panel

Identifies
Exact
Location of
Alarm

One Key Access to Alarm List View

Pertronic F220 Friday 11 March 2016 10:52

Alarm Events

Event	Zone	Location	Type
46	530	GYMNASIUM	Heat Alarm
47	505	LEV 1 APARTMENTS SPRINKLER	Smoke Alarm
48	524	LEV 6 DETECTION	Smoke Alarm
49	530	GYMNASIUM	Smoke Alarm
50	524	LEV 6 DETECTION	Smoke Alarm
51	525	LEV 7 DETECTION	Smoke Alarm
52	530	GYMNASIUM	Smoke Alarm
53	530	GYMNASIUM	Smoke Alarm
54	525	LEV 7 DETECTION	Smoke Alarm

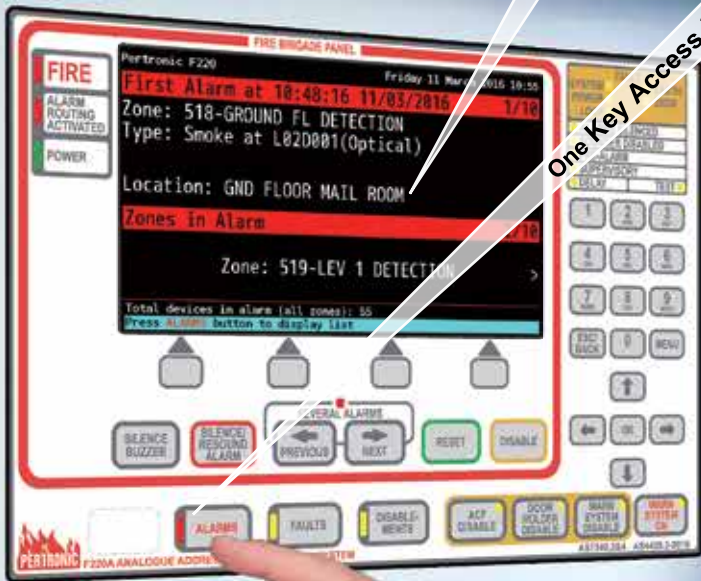
Alarm Point: 50 of 50

Item: OPT at LEVEL 6 ELECT CUPB (L02D071)

Time: 10:48:21, 11 March 2016

Total zones in alarm: 10

Page Up Page Down First Page



Vital Information during Critical Incidents

The **Pertronic F220** makes it easy to track an incident's progress.

The large, 7-inch (180 mm) display allows the F220 to exceed the requirements of AS 7240.2. When the F220 detects an alarm condition, the display automatically shows the exact location of the alarm activation in big, 5mm text, in addition to the zone information required for AS7240.2 compliance.

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16U

28U

40U

AN INDUSTRY TO BE PROUD OF

BY
SCOTT WILLIAMS

Chief Executive Officer,
FPA Australia



Whether it's through our training and accreditation programs, recognising excellence and contribution at our Gala Awards, or our ongoing advocacy for improved regulation, codes and standards, Fire Protection Association Australia is committed to building a better industry. With continued support from our members and the wider industry, we are measurably raising the bar.

In recent years much has been made about a lack of professionalism in the fire protection industry. Over the past five years we've translated this concern into strong action, investing heavily in initiatives—such as our accreditation programs, our upcoming Gala Awards event and our ongoing advocacy work—to improve the professionalism of our industry and its standing within the community.

In 2012, after years of clamour from industry and regulators for national accreditation and licensing of all fire protection activities, we launched our Fire Protection Accreditation Scheme (FPAS).

Today many thousands of individuals are accredited by FPA Australia or on the journey to accreditation, supported by hundreds of industry-leading businesses. FPAS accreditation guarantees minimum levels of training and competency of individuals and ensures that safeguards are adhered to at the business level, such as holding the appropriate insurances.

In 2016–17 the Association will ramp up our accreditation development so that all work in the industry will be covered by an accreditation category.

We want to celebrate professionals, too. That's why we're holding our inaugural Fire Protection Industry Awards Gala event in Sydney on 3 November 2016. The awards will be a respected platform for celebrating excellence and will highlight the best in our industry.

With so many other activities it would be easy to overlook a core mandate—to tirelessly advocate for regulatory change.

For years we have pushed for a nationally harmonised approach to fire protection, inspection and testing. This has now been achieved with all states and territories accepting AS 1851-2012 as best practice for recording and reporting maintenance activities.

Additionally, we have gained representation on the Australian Building Codes Board's Building Codes Committee, appeared before several Senate inquiries and spent thousands of hours meeting with regulators at all levels.

We're not just talking about making the fire protection industry better: we're doing it. Our members and industry partners make this possible and we thank you for your ongoing support and commitment.

Together we're building an industry we can be proud of.

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FIRE AUSTRALIA



OUR COVER

Fire protection of mobile and fixed equipment on mine sites is critically important to life safety and ongoing site operations. The Fire Protection Industry (ODS & SGG) Board has published a guide useful to mining site technicians in the management of fire protection systems and equipment.

PHOTO: SHUTTERSTOCK

ABOUT FIRE AUSTRALIA

Fire Australia is a joint publication of Fire Protection Association Australia, AFAC and the Bushfire and Natural Hazards CRC. We aim to bring the latest news, developments and technical information to the fire protection industry, emergency services and natural hazards research organisations. *Fire Australia* is produced quarterly and distributed throughout Australia and New Zealand. Editorial submissions are welcome and can be sent to: joseph.keller@fpaa.com.au. For more details on submitting a contribution, please contact the editors.

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LAUNCH OF LANDMARK INCIDENT MANAGEMENT PUBLICATION

Incident Management in Australasia, a new landmark publication by AFAC and CSIRO Publishing, was launched in July in Melbourne.

AFAC CEO and co-editor Stuart Ellis introduced the book, which builds on current strategies to improve emergency responses. AFAC's Kent MacCarter jointly edited the book.

The book presents a unique perspective of incident management. It features stories from professionals on the ground and those who reviewed events and gained significant knowledge and understanding through that process.

The Director-General of Emergency Management Australia and one of the book's authors, Mark Crossweller, spoke at the launch, reflecting on the impression *Incident Management in Australasia* will make.

Quoting *The Second Best Exotic Marigold Hotel's* Ty Burley, Mr Crossweller said: "There's nothing I respect more than someone planting trees under whose shade they may never sit."

Mr Crossweller commended the honesty and vulnerability that the

chapter authors had demonstrated through sharing their personal stories. Such recollections will make a positive impression on all in emergency management for future disasters and incidents.

The book features chapters from respected emergency management professionals. Those who attended the event included Euan Ferguson (former Chief Officer, Country Fire Authority), John Watson (Assistant Commissioner, Queensland Fire and Emergency Services), Gavin Freeman (Deputy Chief Officer, Tasmania Fire Service), Trevor White (Chief Operations Officer, Victoria State Emergency Service), Greg Leacht (Metropolitan Fire and Emergency Services Board) and Mark Crossweller.

Other contributing authors include Bernard Teague, Leigh Swift (Northern Territory Fire and Rescue Service), Bob Conroy (former director, Office of Environment and Heritage NSW) and Roy Thompson (South Australian Metropolitan Fire Service). ■

Get your copy from: www.afac.com.au/auxiliary/shop.



PHOTO: CFA

MIGRANT EXPERIENCE OF NATURAL DISASTERS—STUDY PARTICIPANTS NEEDED

A PhD study is looking at how migrants' experiences of natural disasters contribute to a sense of identity and belonging within the community and the Australian landscape and environment.

CRC Associate Student Gretel Evans is seeking participants who have migrated to Australia and faced a natural disaster. In particular, Ms Evans would like to speak to those who have experienced a bushfire in Victoria.

The study is part of Ms Evans's PhD thesis, which she is undertaking at the University of Melbourne. The study will form part of a history project that investigates and documents migrants' memories of natural disasters in Australia. Volunteers must be willing to participate in a recorded interview.

While Ms Evans's PhD is predominantly focused on bushfire experiences of migrants, she is also interested in stories about flood from across Australia. ■

To find out more information or participate in the study, please contact Gretel Evans on: gretele@student.unimelb.edu.au.

[L-R] Euan Ferguson, Greg Leacht (Metropolitan Fire and Emergency Services Board), Mark Crossweller (Emergency Management Australia), Stuart Ellis (AFAC CEO), Kent MacCarter (AFAC), John Watson (Queensland Fire and Emergency Services), Lauren Webb (CSIRO Publishing), Gavin Freeman (Tasmania Fire Service) and Trevor White (Victoria State Emergency Service).



CRC research is helping with education programs.

RESEARCH CONTRIBUTES TO EDUCATION FOCUS

Bushfire and Natural Hazards CRC research has contributed towards improved school education pages on the Department of Fire and Emergency Services WA website. These webpages provide a suite of fun and engaging resources to teach children about hazards.

The resources include classroom lesson plans, teaching resources and interactive activities on fire, natural hazards and safety and emergency prevention for children.

The 'Kids' page provides young children with easy access to interactive 'Bush Patrol' games, the Be Safe Around Water app and colouring-in pages. These resources are intended for primary school teachers and support staff, children from pre-school through to Year 12, and parents. ■

Access these resources at: www.dfes.wa.gov.au/schooleducation.

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EXAMINING BUSHFIRE POLICY

A house lost in Kinglake during Black Saturday.

A study has examined the effect that bushfire policy and preparedness has on people's behaviour during an extreme bushfire.

Bushfire and Natural Hazards CRC researcher Professor John Handmer (RMIT University) and co-author Dr Saffron O'Neill (University of Exeter, UK) have investigated the circumstances around the 172 civilian fatalities that occurred during the 2009 Victorian Black Saturday bushfires. The results are available in the article 'Examining bushfire policy in action: preparedness and behaviour in the 2009 Black Saturday fires' in the journal *Environmental Science & Policy*.

The study uses a unique and detailed fatality dataset compiled by the Victorian

Bushfires Royal Commission from police and forensic records and testimony from family and friends of the victims. Using the data, Professor Handmer and Dr O'Neill focused specifically on the Victorian 'Stay or go' bushfire safety policy in the context of Black Saturday.

The authors detail the assumptions of the 'Stay or go' policy such as awareness of fire risk, knowledge to mitigate that risk, capacity to actively defend a property, a clear and detailed fire plan including behavioural intentions, and triggers for action. The actions taken by each of the 172 people who died were then compared with the intentions and assumptions of the policy.

Three key findings emerged:

1. Some aspects of 'Stay or go' appear to be supported—being well prepared to evacuate remains the safest option in a bushfire; sheltering passively is very dangerous.
2. Successful implementation of 'Stay or go' depends on many factors, which can challenge even the most capable householders.
3. Events like Black Saturday challenge the 'Stay or go' approach, and indicate the need for a different approach on extreme fire danger days.

The article considers the findings of the research in relation to the most recent changes to bushfire policy in Victoria, which includes the shift in emphasis to leaving early. ■

FIRST LEVEL 2 AND 3 ACCREDITED WA BUSHFIRE PRACTITIONERS

FPA Australia congratulates our newly accredited practitioners. We are very pleased to announce that the first Level 2 and 3 bushfire practitioners in Western Australia are now accredited.

Accrediting these individuals will give decision-makers, including the Western Australian Planning Commission, Department of Fire and Emergency Services and local governments, confidence that planning submissions prepared by accredited Bushfire Planning Practitioners are consistent with SPP3.7 and the guidelines.

In conjunction with the 39 accredited Level 1 Bushfire Attack Level Assessors, the announcement is a further step in achieving the State Government's commitment to a professional bushfire consultant industry to inform land use planning approvals and building permit processes with accredited practitioners operating at three levels in Western Australia by 2019.

FPA Australia congratulates our newly accredited practitioners. ■

Level 3

- ◆ Kathy Nastov, Bushfire Prone Planning
- ◆ Mike Scott, Bushfire Prone Planning
- ◆ Erika Dawson, RUIC Fire

Level 2

- ◆ Alex Aitken, Bushfire Prone Planning
- ◆ Michael Whitelaw, Bushfire Prone Planning
- ◆ James Terenciuk, Green Start Consulting
- ◆ Sue Brand, Natural Area Consulting Management Services
- ◆ Zac Cockerill, Strategen Environmental
- ◆ Roger Banks, Strategen Environmental
- ◆ John Greenwood, WA Building Certifiers and Assessors

PRAISE FOR NSW BUILDING REFORMS

Fire Protection Association Australia (FPA Australia) commends the NSW Government, led by the Hon Victor Dominello MP, Minister for Innovation and Better Regulation, on its response to the *Independent Review of the Building Professionals Act 2005* (the 'Lambert report').

The response tabled in Parliament in September outlines the government's full or partial support for 72 of the 150 recommendations set down in the review, including several that have long been championed by FPA Australia. The majority of fire-safety reforms recommended in the Lambert report have been supported as part of the government's response and a further 70 recommendations will now be reviewed in consultation with industry.

Among the many important reforms detailed in the government response, it has made clear it will:

- ◆ take immediate action to strengthen fire safety certification for new and existing buildings
- ◆ require certification by accredited persons for the design, installation, commissioning and maintenance of fire safety systems, preferably drawing on existing accreditation schemes such as the Fire Protection Accreditation Scheme (FPAS) or other relevant schemes
- ◆ enhance the current system of "annual fire safety statement checks" including adopting FPAS or other relevant schemes
- ◆ enhance the number of critical stage site inspections for certain building types
- ◆ require that persons installing passive fire protection measures be suitably trained and licensed
- ◆ consider if further regulation, licensing or industry accreditation should be adopted in respect to the roles of installation and maintenance of fire protection systems

FPA Australia CEO Scott Williams said the NSW Government's response represented a strong commitment to genuine, positive fire-safety reform.


"These are once in a generation changes which are long overdue", he said. "The response not only provides industry with a clear framework for positive building reform going forward, it provides the community with absolute confidence about the safety of their building stock, both new and existing."

"We have advocated for many years, through multiple government reviews, submissions and industry forums that an overhaul of the approach to fire safety in NSW was needed. Minister Dominello must be congratulated for consulting, listening and taking decisive action. We are also grateful to Mr Michael Lambert for producing comprehensive, clear and practical recommendations in his original review. These reforms would not be possible without his important work."

"This response by the NSW government is a clear signal to other states and territories that the community values and expects fire safety to be delivered in a competent manner. Partnering with industry to recognise competency by suitable accreditation schemes rewards industry operators who have invested in the appropriate training and experience. FPA Australia will continue to champion this model with all jurisdictions."


"We know this announcement will lead to improvements in the quality of our buildings, which ultimately leads to better fire safety outcomes for the community. We look forward to working with the government to see these important reforms delivered." ■

The full NSW Government response to *Independent Review of the Building Professionals Act 2005* is available at:
www.bpb.nsw.gov.au/news/strengthening-certification-nsw.



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MAJOR EXPANSION FOR FPA AUSTRALIA

Fire Protection Association Australia (FPA Australia) is excited to announce the launch of a new training centre and the creation of several new positions as part of a major organisational expansion.

Based conveniently at Mascot, in Sydney, the new FPA Australia training centre will provide capacity for the Association to deliver its range of fire protection industry training options face-to-face in dedicated assessment environments.

The new facility will be one of only a few training centres in Australia that are focused on wet systems—including sprinklers, hydrants and pumps—as well as detection and alarm systems, special hazard systems and passive fire protection.

In addition we have also created six new positions within the areas of engagement and events; education and bushfire services; membership and industry services; and technical services. These appointments will

greatly enhance our ability to deliver for our members, industry stakeholders and the community.

The new training facility and staff appointments represent a major investment in the future of our industry.

We recognise the need to partner closely with industry to achieve the Vision and Mission of the Association and ensure our members receive the quality service and training they need to succeed.

The role of our industry training has grown to the point where we have needed a Sydney facility to complement our facilities in Melbourne for some time. This new centre will provide high-quality, professional training in the heart of Sydney's industrial precinct.

In addition, the announcement of six new roles is a strong indication of how rapidly the Association and the fire protection industry in Australia are growing. These appointments will help us continue to deliver on our Vision and

Mission and provide more beneficial services to our members.

In conjunction with the expansion initiative, the internal department structure of the Association has been overhauled to better reflect our full range of services.

The Association departments are now as follows:

- ◆ Member and Industry Services
- ◆ Communications
- ◆ Workplace Relations
- ◆ Education and Bushfire Services
- ◆ Finance
- ◆ Technical Services
- ◆ Engagement and Events.

Further information on the new training facility with a schedule of future courses will be released shortly. ■

For more information about all FPA Australia services visit: www.fpaa.com.au or call 03 8892 3131. If you are interested in working at FPA Australia you can view our available positions on SEEK.

RESEARCH CONTRIBUTES TO CFS COMMUNITY ENGAGEMENT



PHOTO: COUNTRY FIRE SERVICE

like if we do include it," Ms O'Donohue said.

Factoring in emotional preparedness for bushfire planning requires thought, believes Tracey Grime, who coordinates the Community Engagement Officer team.

"Emotional preparedness is not just a tick-and-flick exercise; it is about creating an opportunity, a space, for people to consider that [a bushfire] is one of the scariest things they'll ever experience," Ms Grime said.

At the workshop, seasoned engagement officers shared with newer members how they include emotional preparedness in their role. The most popular method, and one that gained the best response from the community, was to talk about a personal experience where using emotional awareness and management techniques helped in a crisis. ■

You can find further details of the Sampson Flat bushfire research at: www.bnhcrc.com.au.

The CFS community engagement team with Community Fire Safe volunteer coordinator Jeff Ayres at the Sampson Flat fireground.

Bushfire and Natural Hazards CRC research conducted for the South Australian Country Fire Service (CFS) is contributing towards new and improved program materials on group coordination and emotional preparedness for Community Fire Safe groups.

CRC researcher Dr Danielle Every from CQUniversity has briefed the CFS community engagement team

on research findings from community experiences of the 2015 Sampson Flat bushfire. Peta O'Donohue, the CFS Project Manager for Partners in Bushfire Safety, said the research showed that emotional preparedness emerged as a significant gap in pre-fire activities in communities.

"As a group, we wanted to talk about how to include this in our community engagement, and what it should look

1980

1992

1997

2004

2015



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INNOVATION RECOGNISED

The AFAC 16 powered by INTERSCHUTZ conference marked the seventh year Motorola Solutions has partnered with AFAC to recognise innovation in the emergency management sector. The 2016 Motorola Knowledge Innovation Awards were presented to an individual and an agency at AFAC 16 in Brisbane in late August.

The awards are given to recognise innovation, creativity and contribution to the advancement of knowledge across the sector over the past 12 months. For the first time the scope of the awards was broadened to recognise those who have improved research utilisation throughout the sector.

New South Wales Rural Fire Service (NSWRFS) received the 2016 agency award in acknowledgement of the Fire Weather Portal (FWP), an innovative website that displays weather forecasts and observations. The website is a knowledge management tool that assists fire managers by sharing fire weather and fuel information in an integrated system. The FWP has improved situational awareness and capabilities on the ground.



Rose Kapaith, QFES (right), received the Individual Award for her virtual easter egg hunt.

The individual award was given to Rose Kapaith, Senior Online Publishing Coordinator, Online Channel Management, Community Engagement and Partnership Branch, Queensland Fire and Emergency Services (QFES). Ms Kapaith was recognised for her creative approach to ensuring QFES staff were familiar and engaged with the new QFES Gateway intranet.

Ms Kapaith developed a virtual easter egg hunt, which encouraged staff to search for important information and various gateway pages. The hunt allowed QFES to capture data of site pages and identify where more efficient navigation was required, develop an understanding of the site, share information and capture the audience's attention.

Dr Noreen Krusel, AFAC's Manager, Research Utilisation, remarked on the strength of the applications.

"The quality of applications for the awards demonstrates the strong focus on innovation, knowledge advancement and research utilisation throughout the sector and shows a level of dedication to continually enhance our capabilities," Dr Krusel said.

Motorola Solutions representatives presented both awards during the AFAC 16 Welcome and Awards Ceremony. Congratulations to the recipients. ■



Dr Simon Heemstra, Manager Community Planning, NSW Rural Fire Service (right), accepted the award on behalf of the agency.

QUEENSLAND FIREFIGHTING FOAM BAN

The Queensland firefighting foam ban has blindsided the fire protection industry, so FPA Australia has released a new technical document to provide some clarity.

The Queensland Minister for Environment and Heritage Protection and Minister for National Parks and the Great Barrier Reef, Dr Steven Miles, has announced that Queensland will ban the use of all firefighting foams containing PFOS and PFOA.

This policy will "require that any existing stocks of foams containing PFOS and PFOA are withdrawn from service at commercial and industrial premises, and similar products phased out and replaced, as soon as practicable with more sustainable alternatives".

As the peak national body for the fire protection industry, FPA Australia has major concerns with the lack of both consultation and process for implementation of this policy. Subsequent to the Minister's announcement, FPA Australia has released a new Information Bulletin to assist members and the industry with this policy. *Queensland operational policy: environmental management of firefighting foam (IB-14)* is available on the 'Technical' tab from: www.fpa.com.au.

FPA Australia is also updating its original Information Bulletin regarding the technical aspects of foam selection and use. It will be available shortly. ■

WAROONA-YARLOOP REPORT RELEASED

The report assessed the response to two fires that were ignited by lightning in state forest south of Dwellingup, Western Australia, on 5 January 2016.

The fires affected the townships of Waroona and Yarloop, tragically resulting in the loss of two lives and in property damage. Euan Ferguson, former Victorian Country Fire Authority Chief Officer, conducted the inquiry.

The report found that the incident management team's decision to delay initial suppression actions on the first fire because of concerns that the second fire might overrun crews was appropriate given the safety risks that the scenario presented.

The report detailed several strategic recommendations and opportunities for Western Australia relating to the establishment of a Rural Fire Service, lessons learned from previous bushfire emergencies, fuel management and fire prevention, incident management, resource efficiency, information alerts and warnings, evacuation and shelter, traffic management and transition to recovery. ■

Access the report at publicsector.wa.gov.au/waroona-bushfire-special-inquiry.

AFAC/ABCB FIREFIGHTING FORUM

Following discussions between AFAC President and Commissioner, Fire and Rescue NSW Greg Mullins, AFAC CEO Stuart Ellis, and Australian Building Codes Board (ABCB) General Manager Neil Savery, together with their respective Boards, a joint AFAC and ABCB firefighting forum was convened in Melbourne on 1 June 2016.

Representatives from all state and territory fire services, state and territory building administrations, AFAC and the ABCB office attended. This was the first time that all of these agencies had convened.

The purpose of the forum was in part about developing trust and understanding among the agencies, but with the long-

term aim of lifting compliance and reducing costs while not compromising occupant and firefighter safety.

"The forum was a significant event for state building regulators to come together with fire agencies to progress these issues," Mr Savery said. "The ABCB has been working for a long time with AFAC to achieve this and we are very pleased that everyone was able to attend to start this process of collaboration."

The forum's objective was to provide the Boards of the ABCB and AFAC with options that both believe are feasible for improving practices that can change the relationship between building control and fire authority intervention through the building approval process.

"As fire agencies we need to consider where we can accept trade-offs to ensure better public safety outcomes while maintaining occupant and firefighter safety. The alternative might be seeing fire services written out of the process entirely, which would be a hugely retrograde step," Mr Mullins said.

The meeting was highly respectful and constructive, and acknowledged that problems existed within and between the building control regulatory environment and fire authorities.

AFAC and the ABCB office will jointly develop a paper on the outcomes of the forum and provide more detail on potential opportunities that their respective boards can consider. ■

LAURIE LAVELLE AWARD WINNERS ANNOUNCED

The 2016 Laurie Lavelle Achiever of the Year Award was presented at AFAC 16 powered by Interschutz in Brisbane, to acknowledge significant contributions to the sector. The award was granted to Alan Rhodes of Emergency Management Victoria and Allan Brown of New Zealand Fire Service. Mr Rhodes was recognised for his role in the review of the Bushfire Safety Policy Framework, leading the way in the social science of bushfire safety.

Mr Brown was acknowledged for his work in publishing twelve bilingual books written in Te Reo Maori and English, to raise awareness of fire and other dangers in vulnerable communities.

The Laurie Lavelle Achiever of the Year Award was introduced in 1997 to recognise individuals who have made an outstanding contribution to emergency services in any one year.

The 2016 Laurie Lavelle award winners: Allan Brown, New Zealand Fire Service (left), and Alan Rhodes, Emergency Management Victoria (right) were presented with their awards by Laurie Lavelle (centre).



The award is now appropriately named after Laurie Lavelle who was a long-standing Chief Fire Officer of the Melbourne and Metropolitan Fire Brigades Board and the inaugural CEO of AFAC from 1993 – 2001. Laurie presented both winners with their award at the AFAC 16 Welcome and Awards Ceremony.

Congratulations go to Mr Rhodes and Mr Brown on their awards. ■

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PHOTO: FIRE & RESCUE NSW

FRNSW Fire Investigation and Research Unit conducted test smoke alarm burns at the FRNSW Research and Training Facility in Londonderry, NSW.

Twenty-seven activation scenarios were tested including smouldering and flaming fires in the kitchen, bedrooms, lounge rooms and hallway.



PHOTO: FIRE & RESCUE NSW

SMOKE ALARM RESEARCH

Smoke alarm performance and suitability has been tested and assessed in a research initiative conducted by Fire & Rescue New South Wales (FRNSW). Throughout May and June, residential smoke alarms were put to the test at the FRNSW Research and Training Facility in Londonderry, NSW. Testing involved a comprehensive series of representative fire scenarios in a full-scale purpose-built replica residence.

Twenty-seven activation scenarios were conducted and each was repeated three times. Activation scenarios

included smouldering and flaming fires in bedrooms, a lounge room, a kitchen and a hallway. Some nuisance activation scenarios were also incorporated to test for things such as burnt toast and steam on smoke alarm activation and performance.

Four types of sensor technologies were considered in the tests—photoelectric, ionisation, dual (photoelectric and ionisation) and multi-criteria (photoelectric and heat). Smoke alarms were located in three locations in each room—the ceiling, a wall and dead space.

The test prop contained 48 smoke alarms for each test. To accurately record the activation data, each alarm was connected to a cable that sent the activation signal to a data logger, which enabled an accurate activation time to be recorded. Before testing, all smoke alarms underwent sensitivity testing at CSIRO.

Thermocouples located throughout the building monitored temperature; the data logger also captured this data. A unique aspect of this research was the inclusion of gas analysers to monitor the atmosphere in the building during each test.

FRNSW recently purchased two Fourier transform infra-red (FTIR) gas analysers, which enable the monitoring of up to 50 high-temperature and high-concentration toxic fire gases. Analysing fire gases enables the life tenability within a residence to be considered, and from this, available safe egress times for residents can be estimated and compared against the activation time of the smoke alarms.

This research was jointly funded by FRNSW and the Australian Buildings Code Board (ABCB). The findings will inform the ABCB's requirements for smoke alarms and FRNSW's guidance for the community. ■

PORTABLE FIRE EXTINGUISHERS FAQ RELEASED

FPA Australia has released a new technical Information Bulletin, *Frequently asked questions: portable fire extinguishers (IB-13)*.

The Information Bulletin provides basic information on portable fire extinguishers, including their purpose, when they are required, what types of extinguisher are suitable for different fires, how to use them and the requirements to have extinguishers serviced (maintained).

This document provides consumers and fire protection companies with overview of the factors in selection, use and servicing (maintenance) of portable fire extinguishers and directs consumers to resources for more information.

FPA Australia acknowledges the contribution of the Technical Advisory Group for Portable and Mobile Equipment (TAC/3/7) to this document. ■



View and download IB-13 at: www.fpa.com.au/technical/technical-documents/information-bulletins/ib-13-frequently-asked-questions-portable-fire-extinguishers.aspx.

For more information, contact FRNSW's Fire Investigation and Research Unit on 02 9742 7395 or FIRU@fire.nsw.gov.au.

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NEXT GENERATION OF INDUSTRY INFLUENCERS

The first wave of PhD students from the Bushfire and Natural Hazards CRC will graduate this year. The students are making their mark, ensuring that science and research continue to play vital roles in emergency and land management.

BY **FREYA JONES**

Building the capacity and capability of emergency and land management agencies to undertake high-quality research is one of the main goals of the Bushfire and Natural Hazards CRC. To achieve this, highly skilled researchers are needed. The Bushfire CRC started this eye to the future in 2003, aiming to provide tangible benefits to the sector through hosting dedicated PhD students to explore a range of challenges across multiple hazards.

Graduate numbers sit at 68 since the scholarship program was established in 2003. The program has expanded significantly through the Bushfire and Natural Hazards CRC and now supports a further 100 students—comprising scholarship recipients and associate students, all of whom can access CRC events.

The program enables postgraduate students with a desire to work in emergency management to make valuable connections to the sector. As well as offering financial support, the program provides students with access to a network of peers, opportunities to present their research at conferences, connections with end users and industry professionals, access to channels to promote their research and, most importantly, an underpinning support system.

Bushfire and Natural Hazards CRC Contract Research and Education Manager Lyndsey Wright has overseen the scholarship program since 2008 with the Bushfire CRC. She continues to do so for the Bushfire and Natural Hazards CRC.

“It is the strength of the opportunities given to the students which enables them to move into the industry so much

more practically on completion of their studies,” Ms Wright said.

“We work very hard to make students feel part of the CRC family. They can pick up the phone and talk to people in the industry. This access gives them enormous benefits, which are not normally available to students.”

Several completed CRC PhD students are proving their influence through continued work in the sector. Dr Claire Cooper, Dr Adam Leavesley, Dr Valerie Densmore and Dr Felipe Aires have all successfully transitioned from student researchers to emergency management professionals.

Human factors and decision-making

Dr Claire Cooper completed her CRC PhD with La Trobe University in 2011, considering firefighter decision-making and worst-case scenario thinking. Dr Cooper was part of a team of researchers who studied organisational psychology and human factors with a particular focus on fire and emergency service workers.

“In terms of the process of the PhD I found that the CRC was really beneficial. It was another group of people you could connect with that were separate from your university group,” she said.

The connections made through the CRC proved essential in Dr Cooper’s career, and in ensuring her research was providing real benefits to the sector.

“The CRC gave me the opportunity to connect to lots of end users to make sure the research was practical, useful and beneficial to the sector, rather than just a means to get a PhD or publish research articles.”

Since completing her studies Dr Cooper has worked at Victoria’s Department of Environment, Land, Water and Planning and the Country

Fire Authority. She is now at Emergency Management Victoria as Manager, Standards and Review, a role that correlates with her research background.

“My role has two aspects—to develop performance standards for responder agencies across the sector and establish a coordinated approach to continuous improvement across the emergency management sector,” Dr Cooper said.

“A lot of the work I did through my PhD exploring human factors and psychological approaches to training and decision-making directly relates to what I am working on at the moment.”

Dr Cooper noted several advantages to being part of the CRC, including attending and presenting at conferences and the encouragement to promote her research through various channels.

“The CRC did a lot of work to encourage us to write in different ways for different audiences. The conferences were part of that, but there were also publications like *Fire Notes*, regular updates and research reports that were part of the requirement.

“That was a really good form of training, to think about how you are going to talk to each type of audience. I was terrified of presenting when I first started but because I had lots of opportunities to do that and was pushed and encouraged, I was able to adapt my message for the audience.”

Fire mosaic and biodiversity

Dr Adam Leavesley completed his CRC PhD in 2008 with the Australian National University, investigating the effect of fire mosaics on birds in mulga woodlands of central Australia.

Since completing his studies, Dr Leavesley has worked with Bushfires NT in Alice Springs, learning about the practical side of fire management,



As part of his firefighting role, Adam was deployed to Tasmania in early 2016. Here he is at the Little Henty River fire, near Zeehan.

before moving to Canberra to work with the ACT Parks and Conservation Service as a Fire Management Officer. He said it was the connections he made through the CRC that allowed him to find his place in the industry.

"Being part of the CRC was vital to my career progression. I knew the people and, importantly, they knew me when I've been looking for a job," he said.

"That made a vast difference because they already knew a bit about what they were getting and I understood a bit about their business.

"My current role involves planning relating to new developments in the ACT, making sure that the designs meet the standards for bushfire-prone areas."

Dr Leavesley was an end user in the Fire in the Landscape project in the second phase of the Bushfire CRC and is now working to implement the research.

"We worked with the University of Melbourne researchers to prepare AFAC national guidelines on bushfires, erosion and sedimentation, and we're also implementing the research in the ACT where water catchment is a very high proportion of the landscape.

"We're leveraging our relationships

with researchers to help implement other research including fire severity mapping, fuel mapping using LiDAR and benefit-cost analysis.

"It's a fantastic role that I really enjoy, looking at the work people are doing and making judgements about how it might be implemented and how you might use it going forward," he said.

Dr Leavesley is also involved in the new suite of research from the Bushfire and Natural Hazards CRC, supporting its utilisation as end user for five current projects.

Dr Leavesley said his background in research has proven beneficial in his position.

"The analytical skills and being able to interface with researchers and understand the limitations of research and science have helped me in my role."

Restoring ecosystems

For her CRC PhD, Dr Valerie Densmore explored how woody legumes, typified by wattles, can play a central role in restoring ecosystems following bushfires. Dr Densmore completed her PhD studies at the University of Sydney, graduating in 2014.

"Without the CRC I would not have been able to complete my PhD."

Dr Felipe Aires

She said that during her time as a student she realised she needed to increase her involvement in the sector and the CRC provided her the platform to do so.

"Attending the annual AFAC and Bushfire and Natural Hazards CRC conference during my studies made me realise I needed more industry experience for better perspective," Dr Densmore said.

"I joined the NSW Rural Fire Service as a volunteer firefighter, and discovered how much I enjoy fuel management. It made me want to find a career that integrated fireground operations with research."

Dr Densmore has since joined the Department of Parks and Wildlife in Western Australia and works within its training and development program.

"I work as an operations officer in different fuel types. The department has also given me opportunities to help develop a fire ecology course to be given to other officers to help ground our operational activities with ecological and conservation principles."

Dr Densmore said the CRC was vital to her career progression.

"The financial support was a great help, as was the perspective I gained by being exposed to the emergency services industry."

Measuring flammability

Dr Felipe Aires investigated the effects of woody weeds on fuels and fire behaviour of eastern Australian forests and woodlands for his CRC PhD, completed in 2014 at the University of Sydney.

"There is very little knowledge about how weed plants alter fuel flammability and fire behaviour anywhere, not just in Australia," he said.

WHERE ARE THEY NOW? SOME OF OUR CRC GRADUATES

This has been completed to the best of our knowledge. If you have more recent information, or if you are not on this list, please contact us.

FORMER STUDENT.....CURRENT ORGANISATION

Vicky Aerts	NSW National Parks and Wildlife Service
Felipe Aires	NSW National Parks and Wildlife Service
Karyn Bosomworth	RMIT University
Claire Cooper	Emergency Management Victoria
Sean Cowlshaw	University of Bristol, UK
Steven Curnin	TasWater
Helen Daily	CSIRO
Robert de Ligt	Mullion Group
Valerie Densmore	Department of Parks and Wildlife, WA
Annemarie De-Vos	University of Rotterdam, the Netherlands
Sondra Dickinson	Department of Health and Human Services, Victoria
Grahame Douglas	Western Sydney University
Andrew Edwards	Charles Darwin University, Bushfire and Natural Hazards CRC
Christine Erikson	University of Wollongong
Veronique Florec	University of Western Australia, Bushfire and Natural Hazards CRC
Anjali Haikerwal	Monash University
Peter Haynes	Privately consulting
Jessica Heath	Office of the Environment NSW
Bryony Horton	NSW National Parks and Wildlife Service
Meaghan Jenkins	University of Wollongong
Tarnya Kruger	RMIT University
Phil Lacy	PF Olsen Limited
Brianna Larsen	Deakin University
Adam Leavesley	ACT Parks and Wildlife Service
Brenda Mackie	Emergency Management Victoria
Anne Miehs	NSW Rural Fire Service
James Minas	State University of New York, US
Rowena Morris	NSW National Parks and Wildlife Service
Jaymie Norris	NSW National Parks and Wildlife Service
Mika Peace	Bureau of Meteorology, Bushfire and Natural Hazards CRC
Matthew Phillips	Federal Department of Defence
Brendan Pippen	Federal Department of the Environment and Energy
Tim Prior	Centre for Security Studies, Switzerland
Jenni Raines	Firefighter, Country Fire Authority
Rowan Sadler	University of Western Australia
Hari Ram Shrestha	University of Melbourne
Colin Simpson	University of New South Wales
Briony Towers	RMIT University, Bushfire and Natural Hazards CRC
Tarryn Turnbull	University of Sydney, Bushfire and Natural Hazards CRC
Martijn Van der Merwe	RMIT University
Rene Van der Sant	Melbourne Water
Grace Vincent	CQUniversity
Josh Whittaker	University of Wollongong, Bushfire and Natural Hazards CRC
Alex Wolkow	Monash University
Danielle Wright	Country Fire Authority
Phillip Zylstra	University of Wollongong



Valerie Densmore conducting a prescribed burn near Kununurra in WA.

“Being part of the CRC was vital to my career progression. I knew the people and, importantly, they knew me when I’ve been looking for a job.”

Dr Adam Leavesley

“When I started my research there was no standard methodology to measure leaf flammability. This was something I proposed in my thesis and which I am still working on.”

Dr Aires said the support from the CRC was instrumental to his studies. “Without the CRC I would not have been able to complete my PhD.”

Dr Aires noted that the financial support, networking and connections to the sector were immensely beneficial.

“Getting to attend the annual AFAC and Bushfire and Natural Hazards CRC conference and meet new people who were able to help with the science was highly valuable,” he said.

Dr Aires, originally from Brazil, found the network of CRC PhD students to be particularly important.

“Getting to know a lot of the other students—especially being from overseas—was really helpful, particularly as there were several other students from overseas. That network was very strong.”

Dr Aires is now the Fire Science Interpretation Officer with the Office of Environment and Heritage NSW, which is part of the National Parks and Wildlife Service.

“My role involves assisting in the development of policies and procedures, integrating the scientific knowledge and findings into our fire management practices.

“I act as a knowledge broker and science communicator. I have to be on top of the latest science and research and make sure we are using the data and results,” he said.

Dr Aires said that his background in research has aided him professionally.

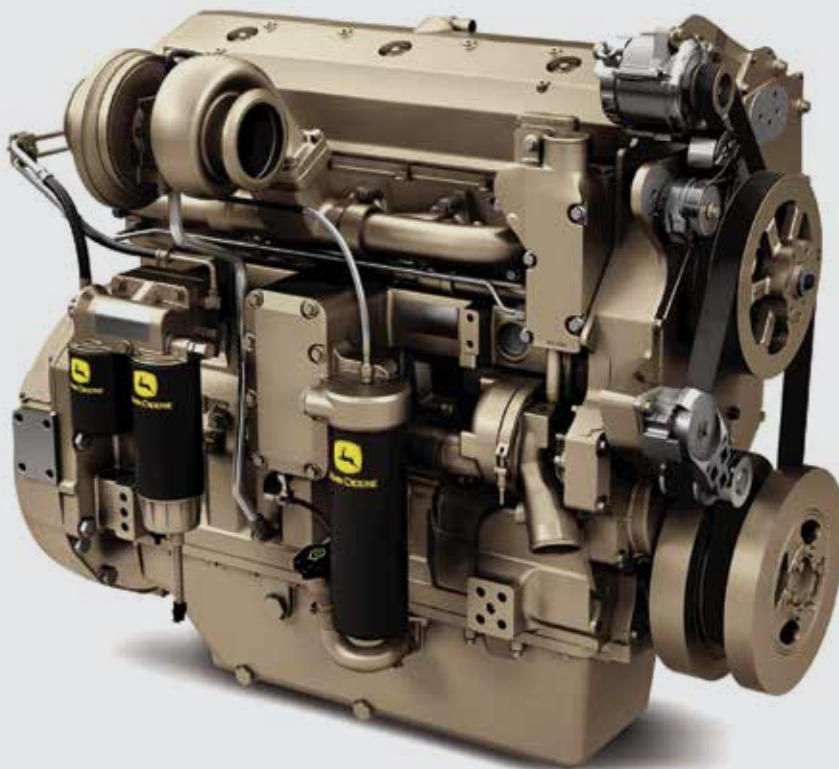
“Being involved with science was fundamental to my role. You have to understand how the academic world works.”

From research to practice

The Bushfire and Natural Hazards CRC student scholarship program continues to provide important outputs to the sector. The next students are already demonstrating their impact and with more set to graduate, the future of science in Australia’s emergency services and land management agencies is in safe hands. ■

Learn more about the CRC student scholarship program at www.bnhcrc.com.au.

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Celebrating excellence

Fire Protection Industry Awards Gala 2016

In 2016, for the first time, FPA Australia will publicly celebrate the best of the fire protection industry at the inaugural Fire Protection Industry Awards Gala in Sydney on 3 November.

BY **JOSEPH KELLER**

Communications Manager, FPA Australia

The Australian fire protection industry now has its own dedicated awards, which will be presented at an annual awards event. This event will become a pivotal date on the fire protection industry calendar, with winners taking their own special places in creating a lasting legacy for the industry.

The event will introduce four new awards to our existing accolades: Young Achiever Award, Barry Lee Technical Excellence Award and the prestigious Fire Protection Company of The Year Award (in two company size categories).

By showcasing the best our industry has to offer, we are redoubling our commitment to professionalism and providing strong benchmarks for all industry stakeholders to aspire to. The awards will be the feature of an enjoyable social event where everyone can dress up, socialise with their peers and celebrate excellence.

Gala Event—Doltone House, Sydney

Doltone House in Sydney's Hyde Park is the perfect venue for this prestigious event, as it has recently undergone a complete interior design makeover by leading architect Kochi Takada. In Doltone House, timeless elegance meets modern design and traditional hospitality meets the new wave. Bronze mirrors, aged brass and double-stitched leather create a luxe interior.

The venue boasts 5 m-high ceilings with abundant natural light from floor-to-ceiling windows with uninterrupted views of Sydney's Hyde Park. Rich black and metallic decor offset with neutral creams and whites give a fresh, clean, sophisticated and elegant look.

This wonderful evening will be hosted by Gold Logie Winner and Australia's original celebrity game show host and all-round entertainer, Mr Tony Barber.

Mr Barber has graced our television



PHOTO: DOLTONE HOUSE

The sumptuous surroundings and menu at Doltone House will ensure the Awards Gala will be an evening to remember.

screens since 1969. Fronting popular game show *Temptation*, he went on to host *Family Feud* and later *Sale of the Century*—Australia's most successful television game show—for which he is best known. One of Australia's most enduring and entertaining celebrities, Tony Barber will make a lively and engaging MC.

To top it off, one of Australia's most entertaining bands—The Enormous Horns—will be on hand to ensure a fun atmosphere for the evening. Combining great musicianship with a highly visual stage show, The Enormous Horns incorporate everything from current radio hits to Blues Brothers and sixties soul, and Frank Sinatra to Ricky Martin. Guests are in for a real treat.

Tickets are strictly limited so book now to secure your seat or a full table of 10.

The awards

Outstanding individuals and companies will be recognised for their contribution to the advancement of the fire protection industry.

Panel-judged awards

HARRY MARRVATT FIRE PROTECTION COMPANY OF THE YEAR AWARD

The award recognises companies that demonstrate an outstanding commitment to the Australian fire protection industry. The winners are selected based on their commitment to staff training, technical advancement, community safety, ongoing professionalism, emerging best practice and innovation. Two company size categories are available: 1–49 employees and 50+ employees.

BARRY LEE TECHNICAL EXCELLENCE AWARD

The award recognises outstanding individual technical contribution to the fire protection industry.

YOUNG ACHIEVER AWARD

The award recognises the outstanding achievement of young leaders in the fire protection industry in Australia. These young people are at the forefront of achievement in the industry.

Industry awards

AV VISCIOGLIOSI OUTSTANDING SERVICE AWARD

The award is presented to an individual

GALA EVENT DETAILS

Date	Thursday 3 November 2016
Time	6.30 pm Welcome drinks 7.00 pm Gala begins 11.00 pm Conclusion
Dress	Black Tie / Formal
Venue	Doltone House, Hyde Park Level 3, 181 Elizabeth Street, Sydney
Tickets	\$240 each (inc. GST) \$2,200 for a table of 10 (inc. GST)
Included	Canapés, three-course dinner, drinks and entertainment



PHOTO: THE ENORMOUS HORNS

The Enormous Horns play everything from sixties soul to current hits.

who has demonstrated outstanding contribution to the fire protection industry. Like the Meritorious Service Awards, the Outstanding Service Award is nominated and selected by the FPA Australia Board of Directors.

MERITORIOUS SERVICE AWARD

FPA Australia offers Service Awards in recognition of the efforts of members who have served and represented the fire protection industry. Awards are available for 20, 30 and 40 years of service.

HONORARY LIFE MEMBER AWARD

An Honorary Life Member has, in the opinion of the FPA Australia Board of

Directors, rendered exceptional service in the work of fire prevention and fire protection in Australia or overseas for more than 15 years.

PLATINUM MEMBER RECOGNITION

FPA Australia takes the opportunity every year to recognise the important contribution made by our Platinum Members.

Our partners

We are proud to welcome so many fantastic awards partners for the inaugural awards event. These awards would not be possible without their generous support. ■



**FIRE PROTECTION
INDUSTRY AWARDS
GALA 2016**

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LESSONS LEARNED FROM PARIS



The 2016 *Knowledge Event Series* guest presenter, Brigadier Général Philippe Boutinaud, Commander of the Paris Fire Brigade



Général Boutinaud shared many insights with audiences across Australia and in New Zealand.

PHOTO: AFAC

Brigadier Général Philippe Boutinaud is in a unique position to present lessons learned from the Paris terrorist attacks.

BY **FREYA JONES**

Throughout May and June, the *AFAC Knowledge Event Series* delivered 'Lessons learnt from the Paris terrorist attacks' in eight locations across Australia and in New Zealand. Guest presenter Brigadier Général Philippe Boutinaud, Commander of the Paris Fire Brigade, travelled to Australia and New Zealand to present a thought-provoking overview of the incident and lessons learned from the November 2015 terror attacks in Paris.

Several lessons learned were identified during the event, offering attendees valuable and unique insights into multi-agency response to a terror attack.

Some key messages emerged around:

- ◆ a new paradigm—planning for the unthinkable
- ◆ support and wellbeing—psychosocial support accessible to all victims, emergency services personnel and their families
- ◆ medical services integration, coordination and support
- ◆ joint training and tactical training exercises
- ◆ social media—delivering timely messages to the public
- ◆ command and control structure
- ◆ resource allocation
- ◆ first responders—learning culture.

More than 1,000 people attended the series nationally from across the emergency management sector including fire, rescue, police, ambulance, government and the wider private and public sectors.

Many AFAC members attended free of charge thanks to sponsorship from Motorola Solutions.

Général Boutinaud provided an overview of the 2015 Paris attacks, including local structures, incident management arrangements and key lessons learned. The Paris Fire Brigade has used these lessons to revise its own doctrine and systems post-incident.

Général Boutinaud acknowledged the valuable opportunity provided by the *Knowledge Event Series*.

"The global threat of terrorism requires us to collaborate and impart knowledge and it was a great privilege to be able to share these important lessons," he said.

Representatives of AFAC's Urban Operations Group hosted the events at each location, engaging with the broader emergency management sector in their jurisdictions. Attendees were able to consider how the lessons learned in Paris could be applied locally. Each seminar concluded with a panel of local speakers from emergency service agencies who reflected on Général Boutinaud's words and provided insight into their own experiences and discussed future planning, training and interoperability considerations. ■

You can read a detailed overview of the key messages at: www.afac.com.au.



Motorola Solutions—partnering with AFAC to bring knowledge to emergency services

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DH80 features:

K-factor: 11.5
Covers: 8.5m in width x 4.3m in length
UL and NYC approved
Spacing between sprinklers: 8.5m
1720 kPa applications

BUSHFIRE SEASONAL OUTLOOK

BY **NATHAN MADDOCK**

Senior Communications Officer,
Bushfire and Natural Hazards CRC

While every month of 2016 to the end of August saw Australia's national mean temperature above the long-term average, it has also been wetter than normal. With the breakdown of El Niño, rainfall has been above average across most of the country—this winter was the second wettest on record. This pattern of heavy rainfall following a strong El Niño is not uncommon and is tied to the warming of oceans around Australia. As a result, there is a mixed picture for fire potential, as shown in the Southern Australia Seasonal Bushfire Outlook 2016 released by the Bushfire and Natural Hazards CRC. The rainfall has resulted in good growing conditions for grasslands, which will pose a threat once the hot weather begins and the grass dries out.

Queensland

While some parts of inland Queensland have seen record rainfalls, much of the state remains drought affected and grass fuel loads are still sparse to moderate in these areas. With the exception of the south-east corner, forested areas have received above-average rainfall in the three months leading up to the start of the fire season. The likelihood of an early northern rainfall onset makes the potential of an above-normal fire season unlikely across most of Queensland. It is important to recognise that an active fire season is still probable and more likely in the areas with underlying soil dryness.

New South Wales

A delayed start to the bushfire season in New South Wales is likely because winter and spring rainfall has been above average for much of the state, with some areas experiencing floods.

However, a predicted end to the current negative Indian Ocean Dipole and more neutral El Niño – Southern Oscillation conditions could see a shift from wetter and cooler conditions towards more typical summer conditions.

It is expected that the significantly higher-than-average rainfall over winter in the central and western parts of the state will result in prolific grass growth over spring. This grass growth, combined with a drying phase and summer conditions, could lead to above-normal fire potential for central and western grassland areas during summer.

The trend towards significantly exceeding average rainfall totals was less pronounced adjacent to the south-western and western boundaries of the state. As a result, the prediction is for normal bushfire potential, as the likelihood of prolific growth is not considered high.

The Sydney Basin and the Greater Hunter have followed the trend for above-average rainfall over winter and are likely to see a delayed start to the bushfire season. However, the prediction for a shift towards more typical conditions over summer could see fuel availability coinciding with the peak of summer, leading to the prediction for normal bushfire potential.

Forested areas south of Sydney have also received above-average rainfall over winter. A late start to the fire season is common for these areas and fire potential is expected to follow a normal season pattern.

ACT

After three wet months the upper soils in the ACT are wetter than average. The forecast changes of the Pacific and Indian oceans towards climatically neutral conditions are expected to bring near-average rainfalls and temperatures through to at least November. This situation could encourage early and vigorous growth of grasses. It will also boost the recovery of the high-country forests that have been affected by large fires since 2003. These higher fuel loads may be offset by the effects of rainfall on fuel flammability. High levels of grassland curing may not be seen until mid-summer. The amount of flammable fine fuel in the forest areas

Bushfire potential 2016

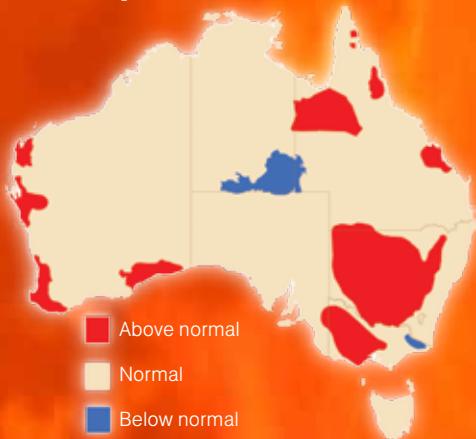


PHOTO: BEN SHEPHERD, NSW RURAL FIRE SERVICE.

is also expected to remain low until mid-summer. As a result, the bushfire potential for this outlook period is assessed as normal. As summer approaches, conditions will be closely monitored, particularly if there is an earlier than expected change to drier conditions.

Victoria

East Gippsland has a mostly below-normal fire potential this year. It has received very much above-average rain in the short and long term, and the temperature outlook is not likely to support strong late-spring drying in the forests.

In west and south Gippsland, parts of Victoria's Central Highlands including Melbourne's water catchments, and across most of south-west Victoria, recent rainfall coupled with a high probability of above-average temperatures indicate strong late-spring drying is likely in forested areas. This could see rapidly escalating fire behaviour later in summer.

Forest fuels have increased since the 2009 fires, so there is once again potential for fire. Similarly, the eastern Otway Ranges, Brisbane Ranges, Wombat Forest and drier forest types bordering Victoria's box-ironbark belt also have a long history of dryness. These areas have above-normal fire potential.

Tasmania

Fuels less influenced by soil moisture such as moorlands, heaths and scrubs have a normal bushfire potential, while forest fuels have normal to below-normal bushfire potential. Grassland fuels have a normal to below-normal potential, but will provide a significant threat in the New Year when they are cured. Fire weather conditions are likely to be average or even subdued. However, if rainfall is above average, the fire season potential will be below normal at least until the New Year when grasslands cure. Overall, the state has normal bushfire potential.

South Australia

South Australia has experienced a wetter-than-average winter, as well as a wet start to spring. As a result, the current Soil Dryness Index is below the 10-year average across the state.

Indications are that most parts of the state can expect a normal fire season. Good rainfall will promote growth, particularly in pastoral areas; however, many of the forested areas have received good soaking rains and will not burn as early as they have in previous years. The exception is parts of the Mallee and Upper South East of the state, which have experienced significant rainfall deficits in recent years. As a result, and despite recent rainfall, these areas are assessed as above-normal fire potential.

Western Australia

In the Eastern Gascoyne, Murchison, Goldfields, Central West and Desert areas, average rainfall and grass growth mean bushfire potential is considered normal. The Western Gascoyne and Pilbara regions have above-normal fire potential as a consequence of higher-than-average grass fuel loads in response to above-average soil moisture. The Wheatbelt and Great Southern regions have above-average grass fuel loads for this time of the year because of good rainfall. However, this is not expected to result in above-average fuel loads at the end of the growing season, given the influence of crop harvesting and grazing. In the Eucla area east of Norseman, above-average soil moisture and subsequent pasture growth, combined with pre-existing mature fuels, have resulted in the expectation of higher than normal bushfire potential. In the South West, despite early and close to average rainfall, there is an underlying long-term deficit in the soil moisture. Recent bushfires and prescribed burning have reduced fuel loads in localised areas. However, on the landscape scale, the high loads of forest fuels have resulted in above-normal fire potential. ■

AUSTRALIAN SOLAR PANELS AND DC DANGERS

REDUCING RISK FOR FIREFIGHTERS

Solar photovoltaic systems are increasing in popularity, which is good for the environment. However, firefighters and other emergency personnel need to be aware of personal dangers posed by these systems.

BY **JIM FORAN**

Director, PV Stop

The growth of solar photovoltaic (PV) systems has been exponential for the past two decades. In the past 10 years especially, the world has seen solar PV evolve from a purely niche market of small-scale applications towards becoming a genuine mainstream

electricity source. Grid parity has now been reached in around 30 countries with predictions that 80% of countries will be at parity by the end of 2017. In numerical terms, cumulative PV power capacity is nearing 200 GW (gigawatts), which is the equivalent of nearly one billion solar panels installed globally. This figure is forecast to reach 2.5 billion solar panels by the end of 2017.

Because of the exponential growth

of the solar industry globally and its rapidly evolving technology, standards and legislation have not been able to keep pace with solar innovation. There is an urgent need for better training programs to educate the various industries that are affected by the increasing popularity of solar.

Firefighter awareness of solar PV systems—being able to identify the different types of solar PV systems and



having a basic operating knowledge of these systems—is paramount to effectively mitigating a fire event involving solar PV systems. Taking this back one step further, it is also essential that firefighters are aware of the differences between direct current (DC) and alternating current (AC) electricity.

Electricity—understanding the animal

Let’s start with electricity basics: watts (W) = volts (V) x amps (A). A watt is a unit of power; it indicates how much power is available (or how badly it can hurt and/or injure you). Remove either volts or amps and you have no watts (meaning no power or electricity).

Alternating current (AC) is generated by a rotary alternator. Electrons drift backwards and forwards in a conductor such as a cable at a particular frequency. The voltage and frequency vary from country to country, but in most regions the voltage is typically either 220–240 V AC (220–240 V) or 110 V AC (110 V). Frequency is typically 50 Hz (hertz or cycles per second) or 60 Hz. Because of this positive and negative charge alternating at a frequency, if you come into direct contact with the electrical current your muscles will contract and release, potentially allowing you to break free of the electrical current.

Direct current (DC) is generated by all solar PV systems. The electrons do not have a frequency as they drift only in one direction, from the source to the load. As a result, if you come into direct contact with the electrical current your muscles will contract and lock, and there is no opportunity to break free from the electrical current. If you do try to break the load (wire short circuit, switch or even your skin) from the source, the current arcs very strongly, either setting fire to or burning the load. From a physiological perspective, given the same voltage and amperage, DC will not allow you to break contact and will cause much worse deep-cell damage than AC.

Solar panels come in a huge variety of sizes and power outputs, anything from 1 W through to modern panels of up to 315 W.

A solar panel consists of many individual solar cells joined in series. Each solar cell produces 0.6 V DC (at 25 °C) no matter what size it is. The size of the solar cell determines the amperage that it produces. The larger the solar cell, the higher the amperage. The output of a typical modern solar panel is 250 W.

These panels are then joined in series (also referred to as a string) to increase the voltage. Domestic solar panel strings are limited to an output

of 600 V and industrial or commercial solar strings are limited to 1,000 V. The limits are caused by several factors including the high cost of circuit breakers and isolators rated at more than 1,000 V and potential problems associated with high voltage stress. Larger commercial and industrial solar PV systems typically consist of multiple strings run in parallel to increase power output.

Types of solar systems

There are three types of solar PV systems. Firefighters need to be able to identify the three types in order to determine the most appropriate risk assessment and isolation procedures, discussed below.

Grid interactive system

A grid interactive system is a solar PV system that is connected to the utility grid. Any excess power that is produced beyond the consumption of the connected load (i.e. household usage) is fed or sold back to the utility grid. This feature allows the property owner the ability to earn feed-in tariff credits from the utility grid provider.

Off-grid system

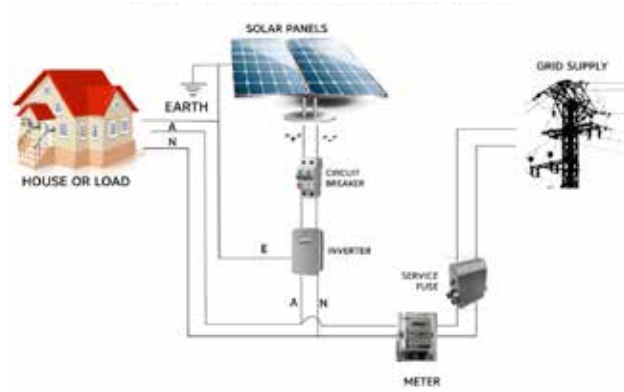
An off-grid system is a solar PV system that is not connected to the utility grid. An off-grid system requires additional components (compared with a grid interactive system) such as battery storage to store excess power, a regulator, mains disconnect and a generator to support the system if power is depleted from the battery storage system.

Hybrid system

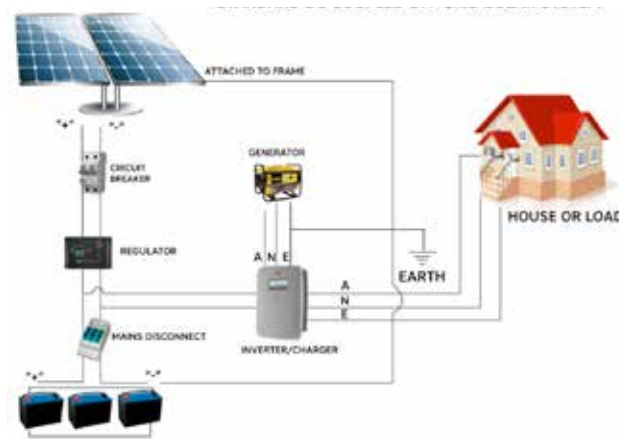
This most recent solar PV system type combines the best elements of the grid interactive and off-grid systems. It provides the convenience of a grid-connected system, including the ability to earn feed-in tariff credits, with the extra flexibility of a battery storage system.

This means that even during a power blackout, you have electricity available. There is also a growing financial incentive in the ability to store your power (through the battery storage system) and relying much less on the utility grid. If you substitute the grid with a generator, this system becomes an AC coupled off-grid system.

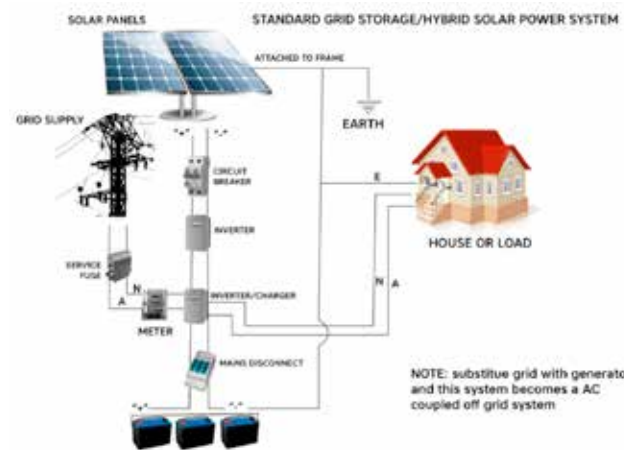
With the ‘best of both worlds’ scenario that hybrid solar PV systems offer, almost every grid interactive solar PV system currently installed will adopt a battery storage system within the next 5–10 years. According to studies by CSIRO in Australia, it is forecast that up to one-half of all electricity generated will be on-site (in homes, businesses and communities) within the next few decades.



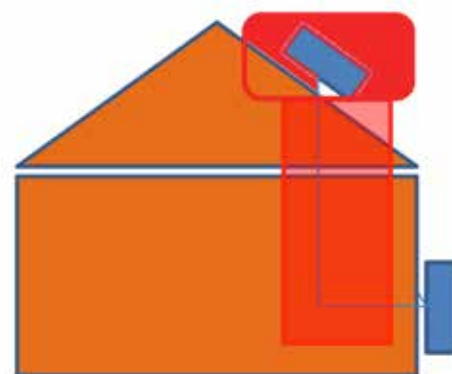
Standard net metered grid interactive solar PV system.



Standard DC coupled with off-grid PV system.



Standard grid storage or hybrid solar PV system.



The red indicates the ‘DC danger zone’.

How do solar PV systems fail?

Reasons why solar PV systems fail range from physical damage and component failure to poor manufacture and workmanship.

Physical damage

Physical damage to solar PV systems can be caused by several factors. Weather events such as hail, lightning, fire, storm damage (such as fallen branches), flooding and water ingress are all well-documented causes of system damage. Vermin attack such as chewed wiring and nesting are other less-considered causes of system damage. It is also worth noting that even when a solar PV system is seriously damaged, broken, shattered, burnt or inundated with water, it can still produce potentially lethal amounts of DC electricity.

Component failure

In Australia, hundreds of solar PV system failures (and fires) have been caused by faulty DC isolation switches. It must also be remembered that solar PV systems comprise delicate electronic componentry to generate electricity. When mounted on roofs and exposed to constant UV under both freezing and boiling-hot conditions 365 days a year, over time they will naturally deteriorate. As such, solar PV systems should be periodically checked and maintained. The vast majority of solar PV systems are relatively new (<10 years old). As these systems age, the number of incidents relating to component failure will escalate on an increasing scale.

Poor manufacture and workmanship

In 2000, eight companies were producing solar panels globally. In 2005, there were 20 companies producing solar panels globally and in 2007, 846 companies were producing solar panels in China alone. Neither governments nor industry sources are properly equipped to manage or audit the existing and growing number of solar PV system installations and it has fallen on fire and emergency services agencies to reactively manage and mitigate these risks as they are encountered.

The DC danger zone

As discussed earlier, as long as solar panels are exposed to light, they cannot be turned off and like any electrical generator or source that is live, must be considered dangerous. Even with an isolation switch installed at the solar PV system inverter, the solar panels on the roof and the electrical wiring leading to the inverter are completely live and

producing potentially lethal amounts of DC electricity. In professional terms this is known as the 'DC danger zone'.

Unlike traditional sources of electricity, solar PV systems cannot be switched off or isolated effectively. If the panels or wiring leading to the inverter are faulty and arcing, the solar panel frame, metal roof or metal guttering all have the potential to conduct lethal amounts of electricity that can ignite fires or electrocute unsuspecting emergency services personnel, electrical technicians or the general public if they come into contact with a conductor (e.g. via a ladder or unbroken stream of water). Up until now there has not been an emergency response protocol or strategy that has adequately mitigated these threats.

In recent times governments and industry have attempted to address the issues surrounding the DC danger zone with limited success.

DC isolators

In Australia, rooftop isolators are a legislated requirement. They were implemented with the intention of turning the panels off in the event of a short circuit or similar emergency. Although well intentioned, switching is an AC electricity solution and is not suitable for DC electrical applications. Every time DC is switched, it arcs on the circuit board and has the potential to set the switch alight. Since legislation was passed in 2011, there have been hundreds of solar PV-related fires in Australia as a direct result of faulty isolation switches and tens of thousands of DC isolation switches have been recalled as a consequence of these incidents.

Anti-arcing equipment

In a further attempt to improve safety, Standards have now incorporated anti-arcing devices in all newly installed inverters. This Standard solves one problem in that it shuts down the inverter and disconnects the load from the solar panels, allowing the panel wiring to enter into open-circuit voltage, extinguishing any 'series arcing' occurring. However, in the case of a parallel arcing fault, it can allow the full amount of the power available to be poured into the fault, fuelling the arc and making the arcing fault worse.

Rapid-shutdown or microinverter panels

Microinverters are a hot topic, especially in the USA where there has been a legislative push to make microinverter solar PV panels the standard (over string panels). Microinverter solar PV panels are being marketed as a safer alternative

to string array solar PV panels, as a small (micro) inverter is installed directly underneath each individual panel, converting the DC to AC electricity and allowing electricity to be shut down directly below the panel.

However, the panel still continues to produce DC electricity at a panel level and cannot be shutdown when exposed to light. The disadvantages of microinverter solar panels is that they are up to three times the cost of a standard string array solar PV system and there are issues surrounding their long term reliability.

PV Stop solution

The Australian company Solar Developments Pty Ltd has developed a potential solution in the form of 'PV Stop'. Delivered from a pressurised cylinder similar to a fire extinguisher, it acts as a 'liquid tarpaulin' covering the solar panel surface and switching off the solar PV system in seconds, rendering the entire solar PV system safe.

With a delivery range of more than 10 m, PV Stop can be applied from the ground or from an elevated platform, eliminating the need to climb on to rooftops and operate at height. PV Stop can be used in all weather conditions and is touch-dry within minutes, creating a waterproof coating that insulates the solar panels and protects the panels from fire, heat and impact damage. The coating is also non-flammable and fire retardant and can extinguish the panels if they are on fire. In addition, the coating is non-conductive and anti-arcing, which is essential as its primary function is to isolate the power generated by solar PV systems. The coating also encases any nanoparticles released if the panels are damaged or during salvage operations.

At the completion of an incident, the dry coating can be peeled off the solar panels like a latex sheet without causing any damage to the solar PV system or surrounding structure. The coating is non-carcinogenic and can be safely handled and disposed of with normal garbage waste.

Products such as PV Stop are only one component of the much broader solution required for solar energy and battery storage. Fire and emergency services require new and innovative training resources and fast adoption of new procedures as new products become available to solve new problems. New legislation is also needed to remove the responsibility entirely from fire and emergency services and place more onus on industry and system owners to install systems with more integrated safety solutions. ■

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GETTING THE BALANCE RIGHT

AFAC16 saw the largest-ever attendance for an AFAC conference, as well as the biggest exhibition in the event's history.

BY **FREYA JONES**

Communications Assistant, AFAC

Breaking records for attendance and exhibition size, *AFAC16 powered by INTERSCHUTZ* was a big success in Brisbane. More than 2,500 emergency management personnel and researchers attended the four-day event, from 30 August to 2 September.

AFAC16 brought together global emergency management professionals from emergency and security services agencies, all levels of government, non-government organisations and research and education institutions to the sector's premier knowledge-sharing event.

Leading Australian and international

experts explored the theme *Mitigation, Response, Recovery—Getting the balance right*, which considered some of the new approaches to multi-agency disaster management services. Attendees engaged in conversations and heard from sector leaders and influencers exploring the challenges of integration, diversity and inclusion, transformational leadership, partnerships, building back better, disaster resilience, capacity for coordination and recovery and predictive services.

A new partnership between AFAC and Hannover Fairs Australia, a subsidiary of Deutsche Messe, and organisers of the internationally renowned INTERSCHUTZ exhibition held in Germany every five years, contributed to a successful *AFAC16 powered by INTERSCHUTZ* conference and exhibition.

This year's event featured the largest exhibition in the history of the AFAC conference, with record numbers walking through the doors to hear about the latest in research, technology and equipment in the emergency management sector.

More than 400 emergency management professionals and researchers attended the Bushfire and Natural Hazards CRC Research Forum, which opened the conference on 30 August. Attendees heard how research is shaping innovative ways to keep communities safe from natural hazards.

Dr Richard Thornton, CEO of the Bushfire and Natural Hazards CRC, said the conference and Research Forum highlighted the importance of partnerships between research and the emergency services.

"To have the connectedness that exists and continues to evolve between researchers and emergency management practitioners is fantastic. These critical relationships are increasingly important, and a key aspect of what the Bushfire and Natural Hazards CRC is about. These partnerships are more important now than ever as we continue to embed research findings into

practice," Dr Thornton said.

Scientists shared the latest research into floods, cyclones, fire and other hazards, volunteering, community resilience, shared responsibility and the economics of natural hazards. Professor Gavin Smith, Executive Director of the Department of Homeland Security's Coastal Resilience Center of Excellence (USA), presented a keynote on the role of state government in disaster recovery, which offered an international perspective. Dr Jeff Kepert, a project leader from the CRC and the Bureau of Meteorology, spoke on the advantages of ensemble prediction and how it could benefit emergency services and land management. Closing the Research Forum, Dr Craig Cormick, Creative Director at ThinkOutsideThe, explored community attitudes towards risk, disaster preparedness and public trust in science.

The Hon. Bill Byrne, Queensland Minister for Police, Fire and Emergency Services, welcomed attendees from all corners of the emergency management sector and the globe.

Key speakers on day two included Katarina Carroll APM, Commissioner, Queensland Fire and Emergency Services (QFES), who explored the challenges, complexities and opportunities of leadership within the emergency sector. Commissioner Carroll spoke about her experience with the Queensland Police Service, particularly focusing on her role as Operations Commander for the G20 meeting in 2014, the largest peacetime security operation in Australia's history. Mark Crosweiler, Director-General of Emergency Management Australia, outlined how the sector needs to transform to align with the changing rules of disaster.

AFAC CEO Stuart Ellis AM emphasised the integral role that the conference plays in the continued development of the emergency management sector across Australasia.

"AFAC16 provided attendees a valuable opportunity to share knowledge and information, learn from one another and get to know each other. Over three



The conference opening ceremony at the Brisbane Convention and Exhibition Centre.

"No one agency can do it solo, no one agency can work in isolation. This is about breaking down silos; it's about working in partnership and as one team, all hazards, achieving strategic goals."

— Robin Boniwell, QFES

days there were more than 100 engaging presentations and countless insightful and inspiring discussions," Mr Ellis said.

The comprehensive program featured speakers from across the Australasian region, the UK and the USA. On day three, Rhoda Mae Kerr, Chief of the Austin Fire Department (USA) and President of the International Association of Fire Chiefs Board of Directors, presented on the importance of diversity, inclusion and leading by example. Dr Anthony Bergin, Deputy Director of the Australian Strategic Policy Institute, explored disaster resilience and the role governments and the insurance industry can play through creating resilience incentives for the community.

Queensland as host

Katarina Carroll said she was proud to host the event in Brisbane, applauding the underlying theme of *Mitigation, Response, Recovery—Getting the balance right*.

"The Queensland Fire and Emergency Services was extraordinarily proud to host AFAC16 powered by INTERSCHUTZ. This conference focused on one of the most relevant questions in emergency

management—are we getting the balance right?" Ms Carroll said.

The conference was also co-hosted by the Queensland Parks and Wildlife Service. Director of Operational Support, Guy Thomas, reflected that AFAC16 was an opportunity to share lessons and ideas.

"It provides a really good chance for people to hear some of the success stories people have had and they might take away some of those gems that they can then share with the people that they work with," Mr Thomas said.

A new initiative saw AFAC16 held in association with the Women and Firefighting Australasia (WAFWA) 2016 Conference, which focused on the need for diversity and equity in the fire and emergency service industries. AFAC16 delegates saw the benefits of access to the insightful WAFWA presentations, which QFES Deputy Commissioner Michael Wassing remarked on.

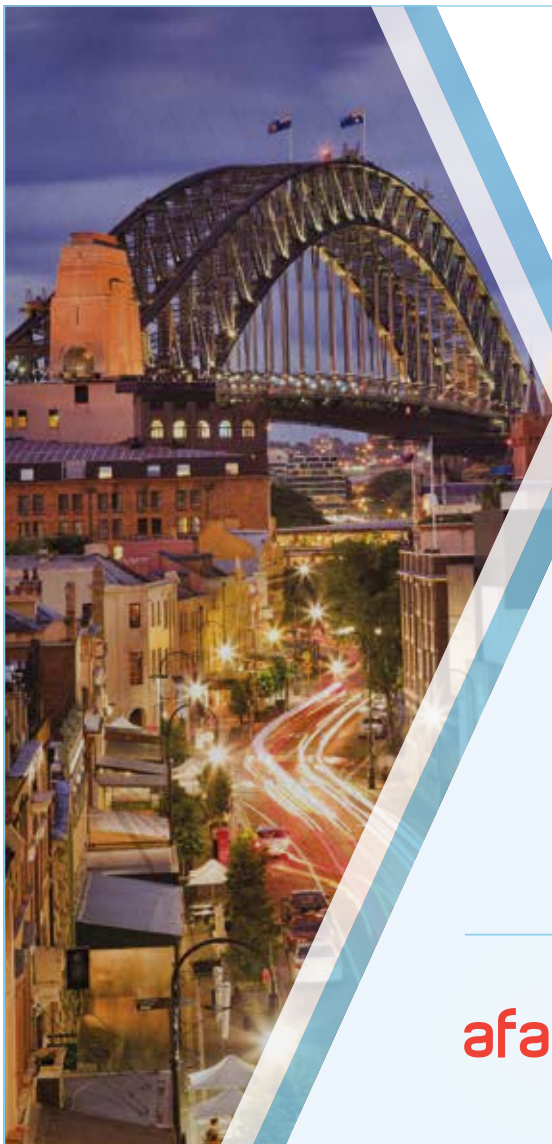
"I think it's been a great synergy in having WAFWA, AFAC and the Bushfire and Natural Hazards CRC all together, with an enormous trade show. When you package all that together it's a pretty powerful piece, a great networking

opportunity and a great opportunity to look, listen and learn," Mr Wassing said.

Complementing the immersive program of speakers, the AFAC16 powered by INTERSCHUTZ Exhibition featured 160 exhibitors from more than 14 countries. Exhibitors showcased an extensive range of equipment and services to emergency management professionals and first responders.

Live demonstrations and the expo stage program proved to be a highlight for attendees, with the Australasian Road Rescue Organisation's exciting live demonstration of a road crash rescue. Among the many exhibitors, the AFAC16 Knowledge Lounge showcased a quality selection of research and conference posters and provided attendees with an opportunity to meet with some of the leading speakers.

Several awards were presented during AFAC16, demonstrating the achievements of emergency management personnel across the sector, including the Laurie Lavelle Award, Motorola Knowledge Innovation Awards and the Bushfire and Natural Hazards CRC Outstanding Achievement Award were all presented



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TWEETS

Katarina Carroll @QFES_chief An integrated, diverse & inclusive workforce will allow us to be champions of progress & enable us to better help our community. #AFAC16

Lisa Sisson @lisamsisson A refreshing and encouraging panel discussion @ #AFAC16 around acceptance of diversity, moving towards core values.

Risk Fronters @RiskFrontiers #AFAC16 was great to work nationally with our end users to inform strategy on reducing flood fatalities @bnhrc

Phillip Pimpano @Phillip_Timpano Tim Peck (beyondblue)—#AFAC16 great presentation how to manage mental health in our work. Worth a further read. Be proactive at your work.

John Cawcutt @john_cawcutt Another great keynote speech at AFAC. Chief Rhoda Mae Kerr on the future of fire services. #qfes #AFAC16

Tea Tree Gully SES @TTG_SES The gala dinner is under way, a great networking opportunity with peers from around the region. #AFAC16 @AFACnews

Cameron Beresford @camberseford Great to see so many agencies embracing all hazards all agencies #EmergencyManagement and #communityresilience at #AFAC16

Troy Gersback @troyggersback Incredibly insightful and profound presentation from Mark Crowweller

@agdgovau at #AFAC16 - certainly a lot to reflect upon in #EM

Peta Miller-Rose @bsisiytheast #AFAC16 Looking forward to the learnings over the next few days. So much knowledge under one roof.

Bushfire & Natural Hazards CRC @bnhrc Ready...set...science! @ceo_bnhrc launching the #AFAC16 Research Forum. 30 great #naturalhazards experts speaking today #Brisbane



The conference opening ceremony at the Great Hall at the Brisbane Convention and Exhibition Centre.

“It provides a really good chance for people to hear some of the success stories people have had and they might take away some of those gems that they can then share with the people that they work with.”

— Guy Thomas, Director of Operational Support, Queensland Parks and Wildlife Service

(see pages 10 and 11). The CRC awards went to the Connecting communities and resilience project team, with PhD student Billy Haworth picking up the inaugural Special Recognition Award.

Two poster awards were also presented, with the Judges' Choice going to John Moy and the People's Choice to Robin Boniwell—both of QFES.

Robin Boniwell said that one of the important take-aways from the extensive event was the strong focus and willingness of the sector to work together and form meaningful partnerships to benefit communities.

“No one agency can do it solo, no one agency can work in isolation. This is about breaking down silos; it's about working in partnership and as one team, all hazards, achieving strategic goals,” he said.

The week finished with seven post-conference development sessions. Three fieldtrips gave attendees the opportunity to see the QFES School of Fire and Emergency Services training

facility, visit the Sunshine Coast to explore land management and hazard reduction burning issues and visit flood-affected areas of Toowoomba and Grantham. Workshops and forums discussed developments in personal protective equipment for firefighters, spatial information technologies, the NSW Rural Fire Service Command, Control and Communications training program, and global trends in emergency management communications.

Over the four days attendees took advantage of the valuable networking opportunities, the chance to see familiar faces, get acquainted with new faces and engage in exciting conversations about the future of emergency management.

Next year's event, AFAC17, will continue the partnership with Hannover Fairs Australia and will be hosted in Sydney at the new International Convention Centre. We look forward to seeing you at AFAC17 to explore the theme *Collaborating for success!* ■

[L-R] AFAC16 closing panel; Chief Rhoda Mae Kerr delivers a keynote address



[Below] This year's AFAC16 powered by INTERSCHUTZ Exhibition was the largest in the event's history.



Australasian Road Rescue Organisation performed a live rescue demonstration.

AFAC16 RESOURCES AVAILABLE

You can find all the conference proceedings on the Bushfire and Natural Hazards CRC and AFAC websites, including presentations, conference papers and posters. You can also view a series of short videos that capture important learnings and highlights from AFAC16. The Research Forum proceedings are available at: www.bnhrc.com.au/publications/researchproceedings2016 and the day two and day three proceedings are available at: www.afac.com.au/events/proceedings.

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NEW ASBESTOS RISK FROM ILLEGAL IMPORTS

Exposure of emergency services, construction and fire protection personnel to illegal imported products containing asbestos could cause the next wave of asbestos-related diseases.

BY **DARRYL J DIXON**

Charles Sturt University and Associate Student, Bushfire and Natural Hazards CRC

Although Australia banned asbestos-containing products in 2003, the reality is that Australia held the unfortunate record as the largest user of asbestos in the world.¹ Now we have one of the highest rates per capita in the world of a cancer caused by asbestos exposure, mesothelioma.¹ Because of this high use, successive waves of asbestos exposure have been, and still are, taking place, including:

1. asbestos miners and those who handled raw asbestos
2. workers who used asbestos products before it was banned, such as builders, plumbers and boilermakers
3. do-it-yourself renovators who remove, disturb and damage asbestos-containing material without protection and environmental exposures

4. emergency services personnel (as proposed by my studies into the exposure of emergency service personnel to asbestos)..

Rather than dealing with the risks associated with the nations' asbestos legacy, a new fifth wave is currently hitting our shores from the use of illegally imported material containing asbestos.

From the Greek 'inextinguishable', asbestos is a group of six minerals categorised into two types: serpentine, including chrysotile (white asbestos), and the amphibole group of anthophyllite, amosite (brown asbestos), crocidolite (blue asbestos), tremolite and actinolite. Most asbestos products contain white asbestos, as it was more abundant and cheaper to mine than the other types.

The health issues associated with asbestos were overlooked for several decades. From the early 1900s illnesses directly attributed to asbestos exposure such as asbestosis (scarring and thickening of the lung), mesothelioma (cancer lining the lungs

and body cavities) and lung cancer were documented, yet disregarded because symptoms and illness were substantially delayed. Symptoms may not appear until 10–40 years after exposure.

Asbestos fibres cannot be seen by the naked eye, felt or tasted, nor can they be immediately detected on scene. They are one of the few hazardous materials that provide no known real-time exposure or contamination effect for emergency services.

In Australia, the asbestos market grew during and after World War II because of the surge in population and a large asbestos stockpile. Close to 3,000 products have been known to contain asbestos, from ropes and tape, vehicle brake linings and disc pads, cement sheeting and panels, pipes, fire-resistant building materials and fire blankets, gloves, lagging, sealants, tiles, fencing panels, artificial snow and ironing-board covers. Before prohibition, nearly two million tonnes of asbestos was consumed in Australia.²

Asbestos in buildings after the ban

While many states and territories restricted the use of asbestos for construction and building products as early as 1984, a national exclusion on the mining, use or reuse, production, storage, installation, sale and import and export of asbestos and asbestos-containing material did not occur until 31 December 2003. Because of this significant delay, residual asbestos products may have been used deliberately or were unknowingly installed until the end of 2003. (Limited authorised exemptions have existed for research, analysis or display and removal from the Australian Antarctic Territory.) One-third of all Australian homes may contain asbestos products.³

In a Senate Estimates Committee hearing in October 2015, Commissioner Roman Quaedvlieg of the Australian Border Force agreed with the Asbestos Safety and Eradication Agency that there is no guarantee that Australian buildings constructed after 2003 are completely free from asbestos.⁴

The assessment is partly based on some recent cases.

A major breach of restrictions occurred in 2012 when some 25,000 Great Wall and Chery vehicles were imported with more than 20 parts—including engine and exhaust gaskets—containing asbestos. Rather than recall or replace the parts, affected vehicles were fitted with asbestos warning stickers. In 2013, Customs in Adelaide intercepted a shipment of motorcycles containing asbestos, which were subsequently destroyed. In 2015, asbestos was detected in fake Toyota Hilux and Hiace brake pads sold through online retailers.

The new Perth Children's Hospital went into alert on 11 July 2016 when workers raised suspicion of asbestos in roof panels when they started to drill and cut into the panels. Some of the roof panels installed contained up to 10% white asbestos. The Western Australian Health Minister, John Day,⁵ confirmed that four of seven panels tested positive for asbestos.

In Brisbane, the Queensland Government's new 41-floor building at 1 William Street was found to have been using asbestos-containing gaskets. All work on the site was suspended in July for 24 hours while the gaskets were removed.

In both the Brisbane and Perth cases the discovery of asbestos coincided with the same supplier. The company responsible has claimed to be the victim of fraudulent international test certificates and is assisting with investigations and inquiries at both locations.

Most recently, at the beginning of August, the Australian Border Force

(ABF) released an independent report containing 11 recommendations. Of particular note is increasing engagement with public and industry and prioritising investigation and prosecutions of asbestos importation. Commissioner Quaedvlieg stated at the time of the release, "Australia is one of the few countries that have a total ban on asbestos and stopping contaminated products before or at the border is a priority for the ABF and the Department".⁶

These examples form a small selection of known cases and provide a problem for anyone who is handling these materials in a variety of stable and unstable conditions and not knowing they contain asbestos fibres.

Responsibility is with the importer

The responsibility under work health and safety laws and the *Customs (Prohibited Imports) Regulations 1956* is on the importer of the material, not the supplier. To minimise potential for exposure to asbestos-containing material, the following information may assist.

- ◆ Before importation, importers need to ensure products are certified 'Asbestos Free' (of all six types of asbestos) in accordance with Australian Standard 4964-2004 *Method for the qualitative identification of asbestos in bulk samples* by a current and valid National Association of Testing Authorities-accredited laboratory or overseas mutually recognised and affiliated facility.
- ◆ Importers need to request to see the analysis certificate for the products.
- ◆ Importers need to use a trusted provider and source of materials. Australian-made products pose significantly less risk, as manufacturers cannot use asbestos.
- ◆ If in doubt, assume asbestos is

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In July this year this new building in Brisbane was found to have been using asbestos-containing gaskets during construction, which were subsequently removed.

present, treat accordingly and enact risk control methods as per the state or territory code of practice on how to manage and control asbestos in the workplace.

- ◆ Before work commences, construction and fire protection personnel need to ensure the asbestos register for the facility or building is up-to-date and inspected; any suspicious material must be tested.
- ◆ Emergency services should have known or suspected asbestos-containing materials listed on their pre-incident plans. State and territory workplace health and safety regulators and environment protection agencies, the Australian Border Force, the Australian Competition and Consumer Commission and the Asbestos Safety and Eradication Agency can provide more information. While this fifth asbestos wave forms a significant health risk and ongoing occupational concern that cannot be eliminated altogether, measures including situational awareness and adding asbestos to risk assessments can reduce potential exposure. ■

ONGOING TECHNICAL ADVOCACY

AN UPDATE ON DEVELOPMENTS

Ongoing advocacy to achieve best practice fire protection regulatory outcomes for the industry and the community is a critically important role for FPA Australia. This article summarises the key technical issues.

BY **MATTHEW WRIGHT**

FPA Australia General Manager Technical Services / Deputy CEO

Building Codes Committee

FPA Australia is represented on the Australian Building Codes Board's (ABCB's) peak technical advisory body, the Building Codes Committee (BCC). The BCC provides advice to the Board to deliver its work program by providing a national forum for regulatory authorities and industry to consider technical matters relevant to building regulation reform.

The most recent BCC meeting was held in Darwin on 14 July 2016. An unprecedented number of issues are being discussed relating to fire protection, including a proposed holistic review of fire safety. This is proposed to be a three-stage process:

Stage 1—Class 2 and 3 buildings— The first stage will include regulatory reduction findings, international comparison and benchmarking, fire risk analysis, review of deemed-to-satisfy (DtS) provisions and a cost-benefit analysis. These changes are proposed to be included in the 2019 edition of the National Construction Code (NCC 2019).

Stage 2—Regulatory reduction projects— This stage will include a review of battery enclosures, fire brigade availability in remote areas and fire hose reels in class 5 buildings. These changes are proposed to be included in NCC 2019.

Stage 3—Other building classes— This stage will involve consideration of other classes of buildings or areas of the NCC. Changes approved as part of this stage may be included in the 2022 version of the NCC. Stage 3 will begin on completion of Stage 1.

These reviews will force our industry to confront long-held approaches to

work practices and while they are likely to result in reduction of some requirements they may increase others. An initial scoping survey has been distributed to industry stakeholders regarding this review.

Several other proposals for change are also being considered:

- ◆ Proposal for change regarding how to determine effective height and rise in storeys. This is critical in determining when a building exceeds 25 m in effective height and requires additional fire safety systems and equipment.
- ◆ Proposal for removal of fire hose reels from class 5 buildings based on additional portable fire extinguishers.
- ◆ Proposal to increase residential sprinkler requirements in residential care buildings.

BCC working groups

In addition, FPA Australia has secured representation on the following working groups, which operate between the BCC meetings:

- ◆ **Ultimate Health and Safety Quantification**—This project focuses on using risk-engineering principles to quantify the acceptable societal and individual risk expected by the NCC and the values being used to quantify the performance requirements.
- ◆ **Bushfire Verification Method (VM)**— This was proposed for NCC 2016 in the public comment draft but was not supported by the BCC because of submissions regarding the values proposed, including those provided by FPA Australia. The ABCB undertook to continue work to develop an appropriate Bushfire VM.
- ◆ **National Advisory Note—External Wall Cladding**—In response to several state regulators producing guidance and calls for a national position, the

ABCB been developing a National Advisory Note on the fire performance of external walls and cladding and consulted with BCC members regarding this. This advisory note has now been released.

- ◆ **Revision of Part A2—Evidence of Suitability**—This working group focuses on changes to Part A2 of the NCC, which establishes options for evidence of suitability. Changes being considered include a hierarchy based on rigour of assessment. The ABCB is now considering the development of a guide similar to that produced by New Zealand, which clarifies the options and provides advice on why you would choose one over the other.
- ◆ **Building Fire Safety Verification Method (VM)**—This project is about developing a VM for fire safety (excluding bushfire) broadly. New Zealand has taken this approach but has prescribed it as the only option to DtS (i.e. no performance solutions, only VM or DtS). It is proposed that the Australian VM would be an option. The concept is to prescribe target values for key elements that would need to be considered, such as fire size and scenario, egress for all occupants, fire brigade intervention and structural capacity. So far FPA Australia's contribution has been to guide discussions to ensure elements and associated values are appropriate. ABCB intends to produce an initial draft prior to the September BCC meeting.

Management of firefighting foam

In July the Queensland Department of Environment and Heritage Protection (DEHP) released its policy regarding the management of firefighting foam.

Unfortunately, FPA Australia was unsuccessful in achieving DEHP or any Queensland Government representative



to engage with the fire protection industry regarding the policy during its two-year development process.

The key issues with the policy relate to the use of fluorinated versus fluorine-free foams and the lack of consideration regarding firefighting effectiveness, clean-up and implementation issues.

In response to the policy announcement, FPA Australia released a statement alerting our membership and the wider industry. We also developed a new Information Bulletin, providing more detailed answers to frequently asked questions and advice and links to the associated policy information and a dedicated email address for individuals to raise concerns (foams@fpaa.com.au). TAC/11/22 oversees a foams working group that is revising our original Information Bulletin on the selection and use of firefighting foams to take on new technology and information received since the announcement of the new Queensland policy.

FPA Australia has also advised that it intends to host a foams forum in Queensland. DEHP is considering a request to attend. FPA Australia is working

to contact other state and territory regulators and the Federal Department of Environment to attend. The key issues are implementing the policy and ensuring that other jurisdictions take an appropriate approach.

Western Australian BCAC appointment

FPA Australia has recently been appointed to the Western Australian Building Commission Advisory Committee (BCAC). The Committee is an advisory forum that comprises all occupational and technical groups directly regulated by the Building Commission, plus industry stakeholder groups that have a key and direct role in the regulated building process. The Association looks forward to actively contributing to the important work of the Committee. NBN migration

As previously reported, FPA Australia has been appointed by the Federal

Department of Communications to chair a working group to develop a technical solution for the migration of fire alarm monitoring from the traditional copper network to the new National Broadband Network (NBN).

This work is now close to conclusion, with four different technical solutions identified depending on the technology used or available. These solutions all deliver the reliability target prescribed by AS 1670.3 and the working group has liaised with FP-002 Fire detection and alarm systems, of Standards Australia, in relation to this.

This working group is now finalising a draft Good Practice Guide, which will be published by the Department of Communications. It will include direct acknowledgement of FPA Australia's assistance and will provide consistency for monitoring companies, technicians, telecommunication companies, brigades, building owners and other key stakeholders. ■

These are just some of the issues being reviewed by FPA Australia. For more information about our technical advocacy, including our full range of technical documents, visit www.fpaa.com.au/technical.

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HUMAN FACTORS RESEARCH BOOSTS AIIMS INCIDENT MANAGEMENT CAPABILITY

What goes on in the minds of Incident Management Team members and leaders during complex emergencies? How do they communicate and coordinate these thoughts to work with others?



BY **BRENDA LEAHY**

Communications Officer, AFAC

Where are we at? What's at stake? Are we on the same page? What is the worst that can happen? Are we meeting our priorities? Have all options been considered? These are just some of the questions that Incident Management Team (IMTs) and incident controllers (ICs) need to ask and address when managing emergencies using the Australasian Inter-Service Incident Management System (AIIMS).

AIIMS is a common platform of emergency management principles for all types of incidents in Australia. Industry protocols, memoranda of understanding, standing orders and procedures across all agencies and jurisdictions are underpinned by AIIMS doctrine. AIIMS can be adapted and scaled to manage any natural and/or human-caused disaster or emergency, from car crashes to bushfires, blue-green algae outbreaks or biosecurity threats, to novel and unknown threats. It has been applied effectively during thousands of incidents, including the most catastrophic

and tragic disasters in Australia's recent history.

The review of the doctrine draws on insights and evidence from the research of the former Bushfire CRC and the Bushfire and Natural Hazards CRC. It also draws on shifts in thinking and policy from guidance received through reviews and inquiries into recent major emergencies in Australia.

AIIMS incorporates the research on human factors and the effects of human psychology and human behaviour on how IMTs and incident controllers perform.

AFAC member agencies have invested in this research and its utilisation over the past decade. Their investment helps to ensure a robust emergency management system and

provides agencies with evidence-based insights and resources for building their response capability. It also equips them to identify and address gaps and opportunities for effective application in all hazards by all agencies.

The latest research utilisation case study published by AFAC focuses on human factors research conducted by social and behavioural scientists from the former Bushfire CRC for use within AIIMS-4 and its related learner and other support resources.

The research outputs were used to improve the overall system and have guided development of a growing portfolio of practical, evidence-based learning, training and exercising resources to support application of

“The human factors research conveyed meaning. It was non-academic, tailored and could be easily interpreted.”

— David Rawet, Department of Parks and Wildlife Western Australia

AIIMS and assist those developing IMTs for the task.

The case study explains how the research made its way into practice. It outlines the approach to utilisation and subsequent adoption by IMTs, as told by the researchers, end users and key people who helped transition the knowledge into practice.

Overwhelmingly, researchers report that agency collaboration through AFAC and professional development are central to the uptake of the research evidence in practice.

SUCCESSFUL RESEARCH UTILISATION

Factors identified as critical for successful utilisation included collaborative development and meaningful research evidence.

Collaborative development

AIIMS and its related learner resources are developed in close consultation with end users through established 'touch points' facilitated through AFAC and its networks and groups.

This approach provides for active, end-to-end engagement in research, from the formulation of research questions through to its implementation.

"The utilisation of research in AIIMS-4 has been successful as the researchers have tapped directly into industry groups through AFAC and sought to understand the issues that they were grappling with," said CRC human factors researcher Dr Christine Owen of the University of Tasmania.

"For example, we engaged directly with the AIIMS Steering Group, the AFAC Director of Workforce Development, the Research Utilisation Manager and the Learning and Development Group.

"We considered and built on the findings of previous research initiatives, involved agencies in setting the research questions and in conducting the field work and surveys. As well as presenting the outcomes of our findings along the way, we created a common space to help end users understand the research outcomes and implications in terms of their people, businesses and broader policy goals."

Make research evidence accessible and meaningful

Traditional research reports often leave it to the reader to work out or interpret the findings for meaning and implications, according to David Rawet of the Department of Parks and Wildlife (DPaW) in Western Australia.

"The human factors research conveyed meaning. It was non-academic, tailored and could be easily interpreted," he said.

"At the same time, the research didn't over-reach. It understood the applications and limits and made room for agencies to interpret and sense-make for their own needs.

"Everyone takes on ideas and knowledge differently. Taking the human factors research through the AFAC collaboration process created a context in which people could make sense of it and see the potential and possibilities," Mr Rawet said.

ALIGNMENT—CONSIDER TIMING AND DEMAND

Dr Owen said at the time, the appetite for using research in AIIMS was strong, driven by the agencies and supported by their national council, AFAC and the AIIMS Steering Group. This, she said, generated active interest and involvement in their research and its utilisation.

"From a researcher's perspective, it's important to understand the climate that the end users are operating within and their challenges and opportunities in order to make progress with utilisation. Otherwise, sometimes, research can end up operating in a vacuum."

To overcome this barrier, Dr Owen and her co-researchers started their studies with a climate study to determine the gaps and issues for incident management. Insights from the research then informed their research questions and utilisation plans.

"You have to understand where the end users are at and then figure out the next steps together. You have to also work in with their timeframes and this is sometimes challenging as research outputs and policy outputs are not necessarily operating on the same timeframes, so you need to think creatively about where the joining points might be to get the best fit."

Set boundaries but be flexible

Dr Owen said flexibility to adjust the research process had been a significant success factor in AIIMS-4.

"This meant making adjustments around the early insights gained from the industry survey and via consultation with the AIIMS Steering Group.

"Typically, it's also a good idea to get support for your deliverables up front. Failure in utilisation often occurs where this flexibility and support hasn't occurred," Dr Owen said. ■



HUMAN FACTORS

Incident Controller Alistair Drayton of Victoria's CFA explains how evidence-based techniques from the CRC human factors research in AIIMS-4 assist in making moment-of-truth decisions.

The fire at Wye River – Jamieson Track on Victoria's south-west coast in the lead-up to Christmas Day 2015 had a lot of decision-making pressure points, recalls Mr Drayton, of CFA's Barwon South Western Region.

The bushfire started in dense forest within the Otway Ranges that backdrop the Great Ocean Road townships of Wye River, Separation Creek, Cumberland River and Lorne less than a week before the annual influx of thousands of Christmas holidaymakers.

Ignited by a lightning strike on a day of extreme fire danger, the bushfire destroyed 116 houses in Wye River and Separation Creek on Christmas Day and had grown to 2,260 hectares by Boxing Day before it was contained a few weeks later in January.

"With one road in and one road out, and Christmas holidaymakers about to surge into the area, it was clear we were dealing with a serious risk," Mr Drayton recalled of making the call to escalate from a level 2 to level 3 incident.

"The predictive tools [PHOENIX RapidFire simulator and decision making support tool], weather forecasts and fire intensity measurement tools, such as infrared mapping, indicated it could be potentially monstrous," he said.

Mr Drayton said AIIMS-4, IMT training and exercising, participation in professional development workshops and using evidence-based learner resources from human factors research all contributed to his thinking, decision-making and management approach.

Decision-making in these high-pressured conditions, he said, comes from your 'mental slides', which are shaped through factors such as AIIMS training, development and exercising, together with the memories and experiences learned from previous events. These mental slides are also augmented by information from your team and others.

"You have to think, act and reflect ... you find your battle rhythm, remembering to ask yourself what's working and what's not," said Mr Drayton. "You scale up and you scale down, using your slides.

"Communication is vitally important—communications throughout the day. It is essential to have formal briefings and two-way updates up and down and between team members and the key stakeholders.

"In terms of situation awareness, you take a helicopter perspective and ask yourself and your team questions like What are my challenges? What are the risks?"



It is vital that mine sites are protected by appropriate fire protection systems.

PHOTO: FPA AUSTRALIA

FIRE PROTECTION IN THE MINING INDUSTRY

Fire at a mine site can be catastrophic for people, production and equipment. Appropriate fire protection systems are necessary and available.

BY **GARRY KWOK**

Member, Fire Protection (ODS & SGG) Board

Mine sites across Australia are both broad and varied in how they operate and the critical natural resources that they search for. However, all have in common highly expensive and mission-critical equipment that typically operates day and night under extreme and hostile conditions in vast, remote and difficult-to-access environments.

The last thing a mining operation can afford is a fire. Not only will it threaten

the safety of personnel and destroy vital equipment, a devastating fire most certainly will be catastrophic to production and profits. This is why it is so important to ensure that mine sites are protected by appropriate fire protection systems.

Fire safety in mining

On a mine site, fire hazards may occur in and around process plants, underground conveyors, static and mobile plants, draglines, workshops, substations, monitored control rooms and switch rooms. In many cases non-gaseous and

gaseous fire suppression systems are preferred to protect the high-value assets and safeguard personnel and processes so as to guarantee business continuity.

Systems and equipment

Non-gaseous systems are primarily used on mobile plant and are usually not scheduled extinguishing agents under the *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989* (the Act).

Gaseous fire suppression systems typically store an extinguishing agent in pressurised cylinders that are connected

to a network of discharge pipework and nozzles, which deliver the extinguishing agent to an enclosure to be protected. Typically these systems also include dedicated fire detection and control systems to provide an automatic discharge if a fire starts.

These systems are best used primarily to protect delicate electronic and electrical equipment against fire due to their quick detection of a fire event and rapid suppression and extinguishment capabilities. An additional benefit is the extinguishing agents used do not leave any residue after discharge, and hence are sometimes referred to as 'clean agents'.

There are two broad groups of extinguishing agents:

- ◆ Inert gases are naturally occurring gases such as nitrogen, argon, carbon dioxide or combinations of these (e.g. IG541, IG55). They extinguish fires by reducing the available oxygen to a level below that which a fire needs to burn (typically <15%).
- ◆ Synthetic gases are manufactured gases that extinguish fires by reducing heat and using chemicals to interfere with the fire chain reaction.

Both types of extinguishing agents have advantages and disadvantages. This means that choosing the most suitable fire extinguishing agent for a specific application will depend on a range of factors including their impact on the environment.

Scheduled extinguishing agents

A number of synthetic extinguishing agents are ozone depleting substances (ODS); that is, when released into the atmosphere they will deplete the stratospheric ozone and/or add to synthetic greenhouse gases (SGG). Thus, when released into the atmosphere they will contribute to global warming.

As such, these substances are defined as scheduled agents under the Act and the *Ozone Protection and Synthetic Greenhouse Gas Management Regulations 1995* (the Regulations). The Regulations stipulate certain obligations in how the agents are to be acquired, stored, used, handled, disposed of and maintained safely to minimise their impact on the environment.

Under the Act, a scheduled extinguishing agent can only be discharged where the product containing the extinguishing agent is used for its designed purpose; in other words, in response to a fire. Discharge for testing or training purposes is not permitted unless the person meets the requirements in the Regulations, and has been granted a fire protection industry permit to do so by the Fire

Table 1 Scheduled agents used on mine sites.

Product name	Uses	Other name
FM-200 FE-227™	Function as total flooding agents. Typical applications include chemical storage areas, clean rooms, communications facilities, laboratories, museums, robotics and emergency power facilities.	Heptafluoropropane HFC-227ea
NAF-P-III	Typically used as a streaming agent. It is a replacement for Halon-1211. Effective on Class A, B and C type fires.	HCFC Blend C
NAF-S-III	Typically used as a total flooding agent. It is a replacement for Halon-1301. Effective on Class A, B and C type fires.	HCFC Blend A

Protection Industry (ODS & SGG) Board (the Board).

It is very important that all mine owners, facility managers and facility operators understand the potential environmental effects of scheduled extinguishing agents if released into the atmosphere.

To learn more about the effects of scheduled extinguishing agents, visit the Department of the Environment and Energy website at: www.environment.gov.au/protection/ozone.

Scheduled extinguishing agents used in the mining industry

Scheduled extinguishing agents that are most typically used on mine sites are shown in Table 1.

Typically these extinguishing agents will be contained in fixed fire suppression systems located in or around fire risk areas such as control rooms, data centres, electrical switch rooms and process control rooms. Large mobile plant including excavators, shovels, draglines, haul trucks and wheeled loaders may also have fire suppression systems installed that may contain such agents. The main scheduled extinguishing agent used on mine sites is FM-200®/ FE-22™ (with minimal use of NAF-P-III and NAF-S-III).

Halon systems (Halon 1301 and Halon 1211) have been phased out because they are significantly ozone depleting and are now typically not found on mine sites. The use of halon has been restricted to only 'essential use', and a halon special permit must be held.

If you are aware of a halon system installed in your facility (easily identified by its yellow cylinders) you should arrange for the system to be decommissioned and the cylinders sent to the National Halon Bank for disposal (call 1800 658 084).

Identifying a gaseous fire suppression system

Rooms or enclosures protected by gaseous fire suppression systems typically have warning signs installed on or above doorways into the room or enclosure.

Most of these systems will operate

MINING FIRE SAFETY SUMMARY

The following recommendations apply for gaseous fire suppression systems to operate effectively on a mine site.

- ◆ Owners and facility managers must ensure technicians working on gaseous fire suppression systems hold the appropriate Extinguishing Agent Handling Licence (EAHL) when installing, decommissioning, servicing or handling scheduled extinguishing agents.
- ◆ Owners of gaseous fire suppression systems must use a maintenance logbook to record all maintenance activity. The use of logbooks will establish a process for documentation and provide a full life cycle chain of custody documentation for all installed systems. A logbook would record all maintenance activity and record the details of the licensed technician who is servicing the system.
- ◆ Ongoing maintenance of systems will greatly improve the efficiency and longevity of the system.

automatically if fire or smoke is detected. Any activity that may cause the detection system to go into alarm (such as soldering or other activities that create clouds of dust or smoke) must not occur unless the gaseous fire suppression system has been isolated.

Some systems may have controls installed to allow the system to be discharged manually if required in a fire emergency. If you are not sure what a control does—don't touch it.

If you need training on how the gaseous fire suppression system installed in your facility works, speak with your supervisor or contact the fire service provider that maintains your system.

Ensuring correct servicing and installation

All fire equipment and systems including gaseous fire suppression systems need to be regularly tested, serviced and maintained to help ensure that they will be ready to operate as intended in the event of a fire. Australian Standard AS 1851-2012 Routine service of fire protection systems and equipment sets out these requirements.

The objective of AS 1851 is to



PHOTO: FPA AUSTRALIA

Fixed and mobile plant equipment on mine sites are often protected by fire suppression systems—here cylinders atop the excavator form part of a suppression system.

maximise the reliability of fire protection systems and equipment such that the systems and equipment meet the requirements of the relevant design, installation and commissioning standards and are likely to continue to do so until the next scheduled activity. Section 7 of the standard contains the inspection and testing requirements for gaseous fire suppression systems.

Under the Regulations, to minimise the environmental impact of accidental discharge of scheduled extinguishing agents, work on such systems must be performed by an appropriate licensed technician.

Fire Protection Industry (ODS & SGG) Board

The Board, appointed by the Federal Minister for the Environment and Energy, administers the fire protection division of the Regulations on behalf of the Australian Government. The Board exercises a range of powers and functions in all states and territories in Australia, including:

- ◆ receiving applications and application fees for fire protection industry permits
- ◆ processing applications within 30 days as specified in the Regulations
- ◆ issuing fire industry permits in accordance with the Regulations
- ◆ inspecting premises as specified in the Regulations.

The Board also undertakes other functions to educate the public and raise awareness of the fire protection industry scheme. The Board:

- ◆ provides customer service support to members of the fire protection industry and the general public
- ◆ undertakes a program of communications and awareness aimed at encouraging compliance with the fire protection industry permits scheme.

The Board provides ongoing information to the fire protection

industry and the general public on its activities and purpose. This improves the awareness and understanding of scheduled extinguishing agents, the legislative requirements surrounding them and the need to reduce their use, and the potential risk for accidental emissions.

Further information

The Board has published a mining industry factsheet and *Ozone Depleting Substances and Synthetic Greenhouse Gases (ODS & SGG) Good Practice Guide*. Technicians servicing or working on gaseous fire suppression systems containing scheduled extinguishing agents at a mine site are encouraged to download a copy of the Good Practice Guide and factsheet from: www.fpaa.com.au/ozone/information/good-practice-guide.

The guide and factsheet provide additional information on obligations under the Regulations and further details on the issues discussed in this article. ■

If you would like further information about this article or wish to contact the Board, please contact Julia Nicolas, Communication and Compliance Coordinator at 03 8892 3131 or julia.nicolas@fpaa.com.au.

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OPPORTUNITIES IN DISASTER RESILIENCE FOR VOLUNTEERS AND EARLY-CAREER STAFF

Volunteers and early-career staff in disaster resilience are set to gain valuable experience through two new programs.

The new scholarships will allow for increased opportunities for professional development of emergency services volunteers



BY **HANSIKA BHAGANI**

Communications Officer, Australian Institute for Disaster Resilience

The Australian Institute for Disaster Resilience (AIDR) is introducing two exciting new programs to support the engagement and professional development of volunteers and early-career employees who are actively engaged in disaster resilience, including emergency management.

Scholarship program

AIDR's scholarship program will provide \$1 million from the Australian Government to boost educational development opportunities for emergency management volunteers. The scholarships will be available to Australian citizens or permanent residents who are active volunteers in an emergency management agency. They will fund accredited vocational or higher education studies that will contribute to the national capability in emergency management and will be linked to the development plans of the volunteer's organisation.

More than half of the scholarships will be reserved for specific groups of volunteers—those who live in a regional or rural area, female volunteers and

Aboriginal or Torres Strait Islander volunteers.

These scholarships will better equip emergency management volunteers to contribute to, mitigate against, prepare for, respond to, and recover from a range of disasters—strengthening their personal contributions to building national resilience.

Resilience Ambassadors

The second opportunity is AIDR's Resilience Ambassadors program, which is open to volunteers and early-career staff working in an organisation contributing to disaster resilience.

The program provides an opportunity for up to four outstanding individuals aged under 30 and actively engaged in disaster resilience to participate in a 12-month program to strengthen their leadership skills and to learn from senior executives from across relevant organisations.

Resilience Ambassadors will participate in structured events and activities for a full year, and will enjoy the benefits of an alumni program in subsequent years. AIDR will cover the costs associated with participation of Resilience Ambassadors in events and activities undertaken through the program.

Outcomes and benefits

Both of these programs will equip participants with new skills, expand their knowledge and networks and provide an understanding of the roles and connections between the organisations that must work together to strengthen disaster resilience in Australia. The programs will foster the dedication of applicants, believes Dr John Bates, Director of AIDR.

"What we're looking for in applicants for both our scholarship and Resilience Ambassadors programs is a strong commitment to disaster resilience and a desire for individuals to challenge themselves, improving their own capabilities and contributing to the capabilities of the sector in strengthening disaster resilience," Dr Bates said.

"We look forward to working with the scholarship winners and Resilience Ambassadors over the length of their programs, and in future years to support their work and keep them connected to other participants and a broader community that is working to enhance disaster resilience across Australia." ■

For more information about the scholarships, the Resilience Ambassadors program and the application process visit www.aidr.org.au.

NATIONAL PRESCRIBED BURNING FRAMEWORKS

The final round of the National Burning Project is exploring the science, planning processes and training for prescribed burning and encouraging sharing of innovation and resources.

BY **DEB SPARKES**

Project Support Officer, National Burning Project, AFAC



Prescribed burning is a tool to reduce risk to life and property, maintain cultural use of country, manage land for multiple uses and improve the condition of ecosystems and biodiversity that depend on fire in the landscape. Many fire and land management agencies across Australia use prescribed burning under various legislative and policy directives.

The National Burning Project is an initiative of AFAC and the Forest Fire Management Group (FFMG) and is funded by the National Bushfire Mitigation Program. The project has sought to bring these agencies together to develop best practice guidelines and risk management frameworks, working collaboratively on decision-support tools and training materials supported by science and experience.

AFAC is committed to building common approaches across the emergency services sector. The National Burning Project aims to consolidate agency practices into a national framework that assists fire and land management agencies to align their approaches and manage fire in the landscape for multiple outcomes while balancing resources, research, policies and risk.

The benefits of a national framework derives from the authority that comes from accessing the best available guidance, greater economy by establishing a single view and greater interoperability with common standards and approaches.

The development of these national standards and approaches requires extensive consultation across agencies and jurisdictions and fosters shared knowledge and networks among those that form strategies for and operationalise prescribed burning objectives. The consultation phase has brought together agency staff from the public fire and land management sectors, and private enterprises that also engage in land management through the use of fire.

Outcomes to date

Since its inception the project has delivered:

- ◆ *An Overview of Prescribed Burning in Australasia*
- ◆ *A Review of Best Practice for Prescribed Burning*
- ◆ *National guidelines for prescribed burning operations*
- ◆ *A Risk Management Framework for Smoke and Greenhouse Gases*
- ◆ *A Risk Management Framework for Fuel Hazards.*

This year the project has released:

- ◆ *A Risk Framework for Ecological Risks Associated with Prescribed Burning*, which synthesises concerns, approaches and activities that organisations across Australia engage in to manage ecological risks across all phases of planning, implementation and evaluation of prescribed burns.
- ◆ *A Risk Framework for Operational Risks During Prescribed Burning*, which considers the risks that can occur during the implementation of a prescribed burn and how each of these risks can be addressed, not just at the time of the burn but through all stages of planning.
- ◆ Training resource materials for prescribed burning targeted for students and teachers
 - ◆ Plan and conduct simple burns
 - ◆ Plan and conduct complex burns
 - ◆ Assist with prescribed burning.

Current projects

National position

The project has developed a National Position on Prescribed Burning that is being considered for endorsement. It outlines 10 key principles of prescribed burning management that are considered by all AFAC and FFMG agencies to be good practice. It is planned that the National Position will be released in November 2016.

Objective analysis

In conducting prescribed burns, many questions need to be considered. Will the burn provide reduction in risk from bushfires? What is the impact of past, current and future burns on the ecological community? Does the burn

affect other ecological services (e.g. water or carbon storage)? What are the costs versus benefits of a burn?

Agencies have decision-support tools to help decide placement and risk associated with burns, but weighing up multiple objectives and the costs and offsets will become easier with the objectives analysis tool being developed as a key output of the project. The tool is undergoing testing on two case studies—one in the Mount Lofty Ranges in South Australia and one on the Central Coast of New South Wales. Once tested and refined by the end of the year, the tool will assist those involved in strategic planning of prescribed burning.

Strategic planning guidelines

Strategic planning across Australia varies in its depth and complexity and is driven by many legislative and policy directives. Capturing and synthesising the common core principles that agencies use will provide a strong guiding process framework that will benefit agencies. Extensive nationwide consultation is taking place and guidelines for strategic and program planning for prescribed burning will be released early in 2017.

New projects

New projects commencing this year and concluding in June 2017 include:

- ◆ investigate training competencies and delivery and make recommendations to address any identified gaps
- ◆ derive performance measures that will allow agencies to quantify and appraise their objectives
- ◆ build on resource-sharing arrangements to help build national capability in prescribed burning
- ◆ develop an online toolbox of decision-support systems for cross-agency collaboration and improvement.

The reports produced by the project are already being used and integrated into agency documentation. As more reports and products are produced the project will have provided nationally aligned principles and an understanding of prescribed burning planning. ■

For further information on the project contact prescribed.burning@afac.com.au or visit www.afac.com.au/initiative/burning. Reports are available at www.afac.com.au/auxiliary/shop.

National Burning Project

The National Burning Project is bringing together inter-related aspects of prescribed burning across Australasia to design guiding frameworks and principles for a more holistic and consistent approach to prescribed burning practices. The project is delivering a suite of products that informs all levels of prescribed burning management.

 <p>NATIONAL POSITION</p> <p>The National Position articulates a nationally agreed position on prescribed burning and establishes principles for the development and implementation of prescribed burning policies and programs.</p>		 <p>OBJECTIVES SETTING</p> <p>Development of a tool for clearer identification of costs and benefits when analysing competing objectives in planning for prescribed burning.</p>		 <p>www.afac.com.au/initiative/burning prescribed.burning@afac.com.au</p>				
<p>COMING SOON</p>		<p>LATE 2016</p>						
<p>PLANNING GUIDELINES</p>  <p>EARLY 2017</p> <p>Strategic</p>  <p>Operational</p> <p>The frameworks and principles identified in these documents will be valuable to practitioners, planners and land managers with an interest in planning or undertaking prescribed burning in the best possible way.</p>		<p>RISK FRAMEWORKS</p>  <p>Operations</p>  <p>Smoke</p>  <p>Fuel</p>  <p>Ecological</p> <p>These reports build and present frameworks that can be adopted agencies to facilitate an improved alignment of approaches and greater appreciation of risks associated with undertaking prescribed burning.</p>				<p>PROCEDURAL</p>  <p>2017</p> <p>A framework for measuring prescribed burning implementation against desired objectives.</p>		
   <p>TRAINING MANUALS</p> <p>These learner resources provide instruction and theory that can be used by students or by instructors for lesson planning.</p>			 <p>2017</p> <p>TOOLBOX</p> <p>The National Tool Box will draw together a repository of decision support tools utilised by agencies that can aid in prescribed burning planning and implementation.</p>		<p>TECHNICAL</p>			
<p>OVERVIEW</p>  <p>This report is a very useful introduction and overview of prescribed burning in Australasia and the evidence base that underpins the use of planned fire.</p>		<p>BEST PRACTICE</p>  <p>The report provides a detailed account of the prescribed burning practices that are considered to be examples of best practice across Northern and Southern Australia and New Zealand.</p>		<p>SCIENCE</p>  <p>2017</p> <p>Reviewing science, practical experience and social licence around the use of prescribed burning as a land management tool.</p>		<p>TRAINING DELIVERY</p>  <p>2017</p> <p>This component will ensure a suitable, adequate and approved suite of competency standards exist for the tasks and roles required for prescribed burning. It will also provide a report that investigates and recommends preferred options for the delivery of national training programs.</p>		<p>SUPPORTING PUBLICATIONS</p>  <p>2017</p> <p>Development of processes and systems that allow for greater opportunities for the sharing of prescribed burning resources between agencies and jurisdictions.</p>

PHARMACY UNDER FIRE ... OR FLOOD...OR CYCLONE

Pharmacies are critical to the health of their local communities. During a disaster they play a further important role, often at their own considerable cost.

BY **KAITLYN PORTER**

Bushfire and Natural Hazards CRC and Queensland
University of Technology PhD student

Local pharmacies played an important role after the
Tasmanian bushfires in 2013.

PHOTO: WAYNE RIGGS, COUNTRY FIRE AUTHORITY

Emergency services stress the need to keep medication in emergency kits. It might sound like common sense, but having the medication you need on hand can save you money and free up vital emergency response for those in critical need. With one-third of the population suffering from at least one chronic disease, maintaining medical supply is vital during an emergency. In order to reduce the pressure on doctors and the healthcare system during disasters, disaster management planning needs to involve community pharmacists.

During a disaster many displaced individuals will present to the nearest available pharmacy requesting a resupply of their chronic disease medications and basic necessities. Often this will be without prescriptions, or even personal identification and money. In times of emergencies, pharmacies can give an emergency supply of medications when the following criteria have been met:

1. A patient's continuation of the medication is essential
2. The pharmacist deems an emergency situation exists for this patient (the patient is unable to obtain a prescription in a timely manner)
3. The quantity sold does not exceed three days' supply.

If these three criteria are met, an emergency supply of a patient's medication may be issued in the absence of a prescription. However, this is not covered by Australia's Pharmaceutical Benefits Scheme (PBS) and is at the patient's own expense. This means that a pensioner could pay up to \$36 for a medication that would normally cost them \$6.20 on the PBS.

With the effects of a disaster often lasting longer than three days, sometimes stretching for weeks, legislation requires affected individuals to return to the pharmacy every three days to receive continuing supplies of their medications, further compounding the psychosocial trauma brought on by the disaster. The alternative to this is obtaining a doctor's prescription, which can put medical resources under strain. While chronic disease management is important, during emergencies hospitals and medical centres have to prioritise their available resources to treat any influx of acutely injured disaster victims requiring immediate medical assistance.

In previous Australian disasters, including the 2013 Tasmanian bushfires, community pharmacies have played an important role in supporting their local communities by staying open late to

ensure people have access to primary healthcare and supplying affected individuals with basic essentials and medications free of charge (at the pharmacy owner's expense). Pharmacies are unable to obtain remuneration from the Australian Government natural disaster relief and recovery fund, as they are not recognised as providing an essential service during the disaster. This places pharmacies in a difficult position—how do they continue to meet the public's healthcare needs when it places a significant financial burden on the pharmacy business? In some instances, the financial impost is so great that pharmacy owners have been forced to close their doors during disasters until the re-establishment of the community health services.

Both federal and state governments have a role to play here. They need to review the emergency supply rules for disaster situations, taking into consideration the added stress to affected individuals and pharmacy staff. They should also accept responsibility for the financial remuneration of community pharmacy owners whose businesses are also affected by the disaster but who choose to still supply their community with basic necessities free of charge. ■



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The rebuilt complex.

THE McCORMICK PLACE FIRE, CHICAGO—1967

BY **BARRY LEE OAM**

One of the costliest fires on record occurred in the United States on 16 January 1967, with the great modern building forming the McCormick Place exhibition centre in Chicago essentially destroyed.

When it opened in 1960, the main 30,000 m² exhibition hall was the largest in the US. With frontage onto Lake Michigan, and measuring 345 m by 107 m, it had three floor levels each with an area of about 36,750 m². The height of the top storey was 9.5 m from the floor to the bottom of the roof trusses above the columns, and the roof trusses themselves were 5 m deep, giving an overall height of 14.5 m from floor to ceiling. The columns on this level had a 76 mm sprayed-on covering of asbestos fibre material to a height of 6 m above the floor, but the steel roof trusses were unprotected.

The main areas of the building were

unsprinklered. It was contended that sprinklers would not have been effective on the main top storey exhibition level because of the ceiling height. The National Fire Protection Association commented that this was incorrect, because sprinklers had been used successfully for many years in large industrial and storage buildings of similar construction and height. It was also thought that any fire in display material would be more or less a 'flash-fire' that would not generate enough heat in the huge main exhibition hall to weaken the exposed steel roof trusses. The fire forcibly disproved this.

The 46th exhibition of the National Housewares Manufacturers Association was due to open on the morning of 16 January. At 2 am the building was mostly occupied by janitorial staff, maintenance personnel and private security guards. At 2.05 am smoke was seen rising from the rear of one of the exhibition booths. After a comparatively slow start, the flames

began to shoot up the booth surfaces, reaching heights of 4.5 m.

The fire spread almost unchecked because hydrants that had been closed for nearby freeway expansion had never been reopened and the lack of automatic sprinklers. Other sources of water proved inadequate. The unprotected steel trusses failed early, collapsing the roof. At the height of the blaze 90 appliances and more than 500 fire and rescue personnel were on the scene. A security guard was killed. The building was worth \$30 million and the displays inside a further \$34 million. But the loss to the area's economy through deprivation of the facility was estimated at another \$100 million.

The rebuilt complex is considerably larger—and safer—than its predecessor. The entire structure, including its parking garages, is fully sprinklered. The Metropolitan Pier and Exposition Authority's attention to code compliance is regarded as exemplary. ■

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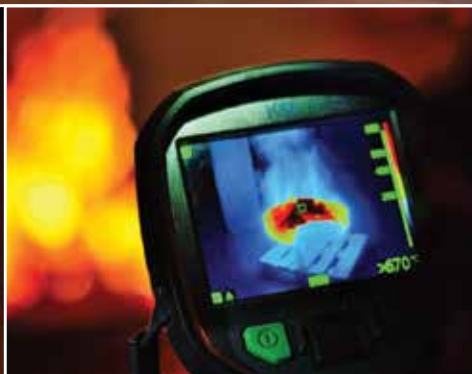
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The World's Sixth Sense™

BY **IAN FINDLAY**

Technical Coordinator, FPA Australia

STANDARDS AUSTRALIA

FP-001 Maintenance of fire protection equipment

Amendment 1 to AS 1851-2012 has been to ballot. There was one negative vote. It is expected that this negative vote will be resolved soon and the amendment progressed to publication in October.

FP-002 Fire detection and alarm systems

A project proposal for a new handbook for fire detection, warning, control and intercom systems has been approved. Work continues on revisions of AS 1603.3 (heat alarms), AS 1670.3 (fire alarm monitoring) and AS 4428.6 (alarm signalling equipment). The AS 4428.4 *Intercommunication systems for emergency purposes* revision and AS 7240.4 *Power supply equipment* amendment have gone to ballot and are expected to be published soon.

FP-004 Automatic fire sprinkler installations

The draft revision of AS 2118.1 *Automatic fire sprinkler systems – General systems* went to combined procedure (public comment and committee ballot) and closed in late July. FP-004 will meet to resolve the public comment.

FP-008 Fire pumps and tanks

The FPA Australia project proposal for an amendment to the Australian Standard for water storage tanks for fire protection systems (AS 2304-2010) has been approved. This project to amend the standard is outlined in FPA Australia Position Statement PS-06 *Water storage*

tanks for fire protection systems, which is available from the FPA Australia website www.fpa.com.au/technical.

FP-009 Fire hydrant installations

Standards Australia is reviewing how to progress the revision of AS 2419.1 *Fire hydrant installations – System design, installation and commissioning*, which stalled as resources were reallocated to ensure other Standards made the deadline for inclusion in the Building Code of Australia 2016.

FP-011 Special hazard fire protection systems

Amendment 1 to AS 4487-2013 was at public comment and closed on 30 September. Work on the revision of AS 14520 (to be recombined and redesignated AS 4214) continues.

FP-018 Fire safety

Work continues on the revisions of AS 1530.8.1 and AS 1530.8.2 (testing of elements of construction for buildings to simulate bushfire attack).

FP-020 Construction in bushfire prone areas

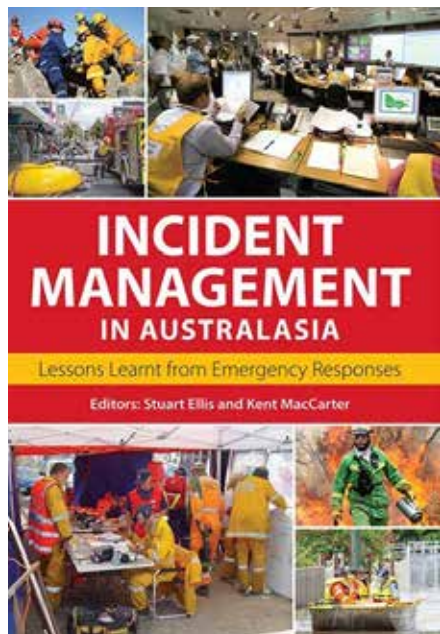
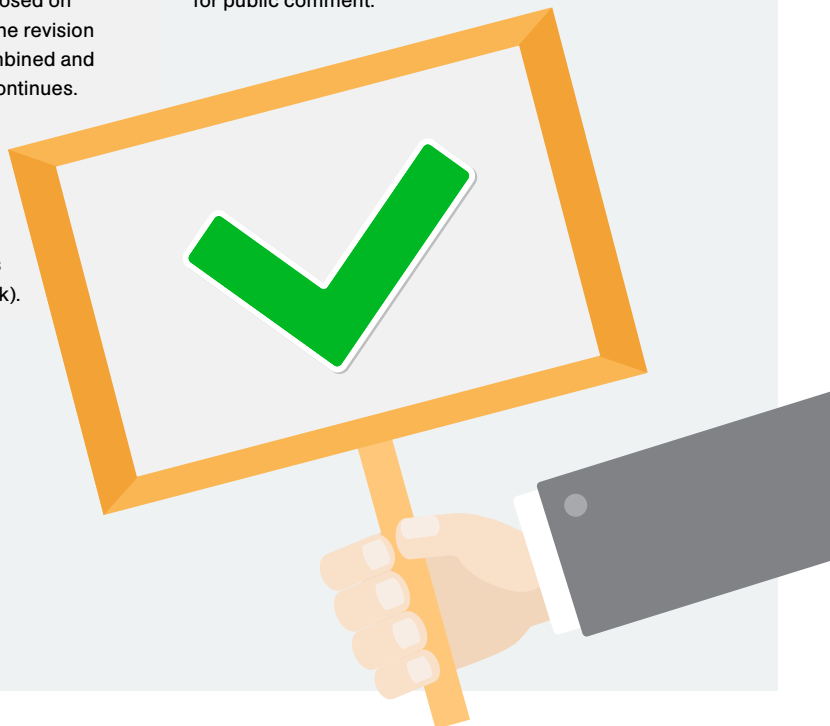
Work continues on the revision of AS 3959 *Construction of buildings in bushfire-prone areas*.

FP-022 Fire protection of mobile and transportable equipment

The revision of AS 5062 *Fire protection for mobile and transportable equipment* was published on 11 July.

LG-007 Emergency lighting in buildings

The revision of the AS/NZS 2293 series of standards for emergency escape lighting and exit signs is nearing release for public comment.



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TECHNICAL AND ADVISORY GROUPS AND SPECIAL INTEREST GROUPS

TAC/1 Maintenance of fire protection systems and equipment

Work on the baseline data Good Practice Guide continues in anticipation of the publication of Amendment 1 to AS 1851-2012. A new technical document is also being developed in relation to routine servicing of aspirating smoke detectors with respect to emerging technologies.

TAC/2 Fire detection and alarm systems

TAC/2 continues to work on Good Practice Guides for speaker layouts and product compliance. A TAC/2 working group continues to assist with the review of Fire Protection Accreditation Scheme (FPAS) design questions.

TAC/3/7 Portable and mobile equipment

TAC/3/7 met for the first time in nine months with a very productive meeting identifying priority activities and the order in which to progress them. TAC/3/7 will be starting with a review of the extinguisher standards.

TAC/4/8/9 Fire sprinkler and hydrant systems, tanks and fixed

TAC/4/8/9 continues to work in collaboration with the Pump Industry Association on a fire pumpset checklist and certification document for use by designers, manufacturers and certifiers. A TAC/4/8/9 working group continues to assist with the review of FPAS design questions.

TAC/11/22 Special hazards fire protection systems

TAC/11/22 and its firefighting foam working group are working on identifying how the Queensland Department of Environment and Heritage Protection Operational Policy on Environmental



Management of Firefighting Foam will be implemented and what advice can be given to assist members and users in understanding and meeting this policy. Work continues on technical documents on oxygen reduction fire prevention systems and vehicle system service technician competency.

TAC/17 Emergency planning

TAC/17 continues to work on a variety of projects as it prepares for the work on Amendment 2 to AS 3745-2010.

TAC/18 Fire safety and TAC/19 Passive fire protection

The August TAC/18/19 meeting was postponed while FPA Australia sought advice from the Australian Building Codes Board (ABCB) regarding its draft Good Practice Guide on fire stopping systems.

TAC/18/19 will then meet to discuss this advice and how to progress the guide.

TAC/20 Bushfire safety

TAC/20 is working together with the FPA Australia national office to inform FPA Australia's position on the further work being done by the ABCB on a bushfire verification method for inclusion in the Building Code of Australia.

TAC/20 continues to follow the development of the AS 3959 revision as well as the update to the NSW Rural Fire Service document *Planning of bushfire protection*.

TAC/T

The August TAC/T meeting was postponed until after the Property Industry Reference Committee meets to discuss its work program.

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