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EMERGENCY MANAGEMENT SYNERGIES

BY
STUART ELLIS
Chief Executive Officer, AFAC

The heads of all emergency management agencies in Australia and New Zealand form the AFAC National Council, which has the remit to create synergies across the emergency management sector. These synergies are realised through a range of platforms and activities including the AFAC Collaboration Network, AFAC Conference, knowledge events and information products.

AFAC supports and participates in partnerships that have sector-wide influence, its members work in close partnership with a number of organisations across the emergency management sector including NGOs such as the Australian Red Cross, Australian Local Government Association, the Bushfire and Natural Hazards CRC, the new Australian Institute for Disaster Resilience and the National Aerial Firefighting Centre (NAFC).

Since 2003, with the support of the Australian Government, NAFC has successfully coordinated cooperative national arrangements for the provision of aerial firefighting resources for combating bushfires and supporting other emergency responses. On behalf of state and territory emergency services and land management agencies, NAFC supports the leasing, maintenance, placement and operational activities of a national fleet of specialised firefighting aircraft across Australia. See the story on collaboratively managing our aerial firefighting resources on page 14 of this issue of *Fire Australia* magazine for details.

The Commissioners and Chief Officers Strategic Committee has initiated the trial of a National Resource Sharing Centre, which will also operate within the NAFC framework. This centre will document emergency management capability across AFAC, extending support to interstate and overseas deployment of resources and streamlining the administrative requirements. It will focus on establishing, maintaining and supporting the activation of interstate and international agreements to boost rapid deployment of resources other than aircraft. A report on the trial will feature in an upcoming issue of *Fire Australia*.

Fire Australia is produced under another of AFAC's key partnerships—with the Bushfire and Natural Hazards CRC and FPA Australia. On behalf of our partners I hope you find this issue insightful.

ADVERTISING LISTING

FIRE AUSTRALIA

IN THIS ISSUE

REGULAR FEATURES

OUR COVER

The DC-10 Very Large Air Tanker drops a line of retardant at the Scotsburn fire in Victoria, December 2015.
PHOTO: KEITH PAKENHAM, CFA

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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Fire Australia magazine is printed by a printer with ISO14001 Environmental Management System Accreditation using vegetable-based inks onto FSC-certified paper.

ISSN 1032-6529 (Print)
ISSN 2200-9221 (Online)

GENDER DIVERSITY ON THE NATIONAL AGENDA

The celebration of International Women's Day on 8 March provided an opportunity to reflect on where the fire and emergency services sector sits in relation to gender diversity. AFAC, together with the sector's commissioners, chief officers, CEOs and fire managers, has released a Statement on Workforce Diversity.

Urban fire services in Australia average only 3% of women in firefighting roles, a figure that does not accurately reflect the community they serve and protect. The statement marks a first step for the sector in coming together to recognise the problem and establish the solutions.

The statement identifies the changes needed to increase attraction, recruitment and inclusion levels across gender, racial and cultural diversity. Across the country, agencies have made strong commitments to implementing diversity strategies, while ensuring that these strategies will not result in lowered entry standards.

In the past many agencies within the sector have attracted negative attention for their lack of gender diversity among career and staff in particular. The statement is the first step in acknowledging and understanding the unconscious bias that exists, particularly within the firefighting industry.

Recent announcements from agencies across Australia highlight a desire to tackle this issue. ACT Emergency Services Agency has pledged to adopt a 50% female intake as part of its Women in Emergency Services Strategy. Launched in December 2015, the marketing campaign *Be a firefighter* has proven successful, with the agency reporting 18% of its recent recruit applications were from women, this is up from 7%.

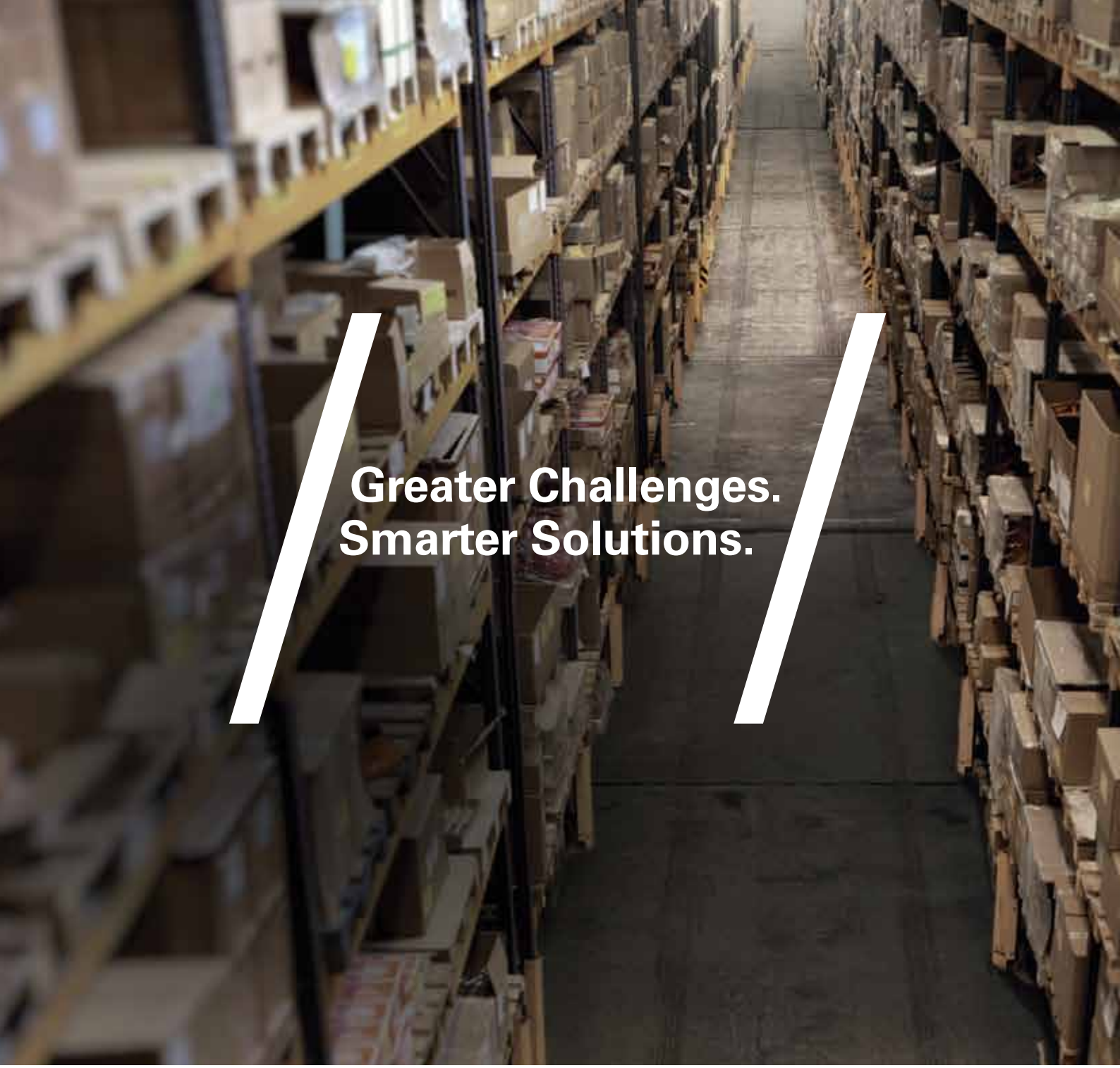
The statement will see agencies commit to working cooperatively to develop and share best-practice strategies to increase diversity across the entire sector. Importantly, diversity issues will be reviewed regularly within agencies and through the AFAC Council.

Ahead of AFAC16, which will take place in Brisbane from 30 August to 1 September, AFAC has partnered with Women and Firefighting Australasia (WAFA) to combine both organisation's annual conferences to present and share current ideas and initiatives on gender diversity. ■

To find out more about this event visit www.afacconference.com.au

Conference panellists putting diversity on the agenda at AFAC15.

The Statement on Workforce Diversity will see agencies throughout Australia commit to working cooperatively to develop and share best-practice strategies to increase diversity across the fire and emergency service sector.



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LACROSSE APARTMENT BUILDING SURVEYOR TO FACE DISCIPLINARY ACTION

Following an extensive investigation, the Victorian Building Authority (VBA) has referred the relevant building surveyor (RBS) involved in the building of the Lacrosse Apartments in Melbourne's Docklands for disciplinary action by the Building Practitioners Board (BPB).

On 25 November 2014, a fire at the Lacrosse building resulted in the evacuation of all residents. The Metropolitan Fire Brigade (MFB) subsequently reviewed the cause of the fire and issued its Post Incident Analysis Report in April 2015.

The MFB concluded that the external aluminium cladding on the building contributed to the spread of fire and did not comply with the Building Code of Australia (BCA). The VBA then launched its investigation.

The VBA investigation has led to the following allegation relating to the RBS, Anastasios Galanos, which has been referred to the BPB:

That the building surveyor breached the Building Act and Regulations and failed to carry out his work in a competent manner and to a professional standard in that:

- he could not have been satisfied that the building work would comply with the Building Act and Regulations when he issued the building permit
- in the course of its investigation, evidence collected by the VBA confirms that the design of the external walls of the Lacrosse building did not comply with the requirements of the BCA.

The Lacrosse building in Melbourne's Docklands.

The VBA referred the conduct of the architect to the Architects Registration Board of Victoria (ARBV), which is the regulatory body responsible for the conduct and discipline of architects.

The VBA investigation into the conduct of other building practitioners involved in the Lacrosse building is continuing and is expected to conclude in coming weeks. ■

For information about the ARBV go to www.arbv.vic.gov.au and for information about the BPB go to www.vba.vic.gov.au/building-practitioners-board.

WORMALD ACQUISITION FINALISED

On 4 December 2015, Tyco entered into an agreement to sell the Wormald Australian fire business to Wormald International, LLC ('Wormald'), a newly established subsidiary of Evergreen Capital, LP. This sale has now been officially completed.

Andrew Lee, Chief Executive Officer, and a number of existing key Wormald personnel now lead Wormald in Australia. Wormald is committed to being a dedicated fire business that focuses on delivering the specialised fire expertise it is renowned for. The business will also benefit from a less centralised and more flexible business structure, with regionally based decision-making driving the business forward.

In addition to the purchase of Wormald Australia, Evergreen has also acquired the National Fire Solutions, GAAM Emergency Products, Exelgard and Simplex Time Solutions businesses from Tyco.

Tyco and Evergreen have a long-standing relationship globally and locally as a result of the sale of Armourguard in New Zealand and the fire and security operations in Fiji two years ago. Evergreen is excited to include Wormald's long-standing global brand in its portfolio.

FPA Australia congratulates Wormald on this important transition and looks forward to the continued strong growth of the business and its involvement and support of the fire protection industry and the Association. ■

MORE ACQUISITIONS AND MERGERS

JOHNSON CONTROLS MERGES WITH TYCO

Johnson Controls, a leading American automotive equipment manufacturer, has announced it is merging with Ireland-based fire protection and security systems manufacturer Tyco International. The newly merged business will operate as Johnson Controls and will be headed by Johnson Controls CEO Alex Molinaroli.

HONEYWELL ACQUIRES XTRALIS

Technology manufacturer Honeywell has committed to acquiring advanced smoke detection business Xtralis. Aspirating smoke detection systems produced by Xtralis are used in data centres, historical buildings, airports, industrial sites and manufacturing facilities to provide very early warning and verification of threats. This speeds response time and minimises facility damage and potential injuries.

FALCK ACQUIRES DEANMAC EMERGENCY SERVICES

International emergency services provider Falck has completed the acquisition of an Australian emergency response company, Deanmac Emergency Services Pty Ltd. Deanmac has approximately 125 staff who are engaged in major contracting in the eastern part of the country, specifically in Victoria and Queensland, with its head office based in Traralgon, Victoria. Falck has businesses in 46 countries. Its activities are focused on preventing accidents and disease; providing assistance in situations of emergency, accidents and need; and helping people move on with their lives after illness or accidents.

PHOTO: ANGRY PLANET

Community members and CFS personnel watch the Sampson Flat fire.

SAMPSON FLAT FIRE RESEARCH FINDINGS

The experiences of the community during the Sampson Flat bushfire in South Australia on 2 January 2015 have been analysed in a report by the Bushfire and Natural Hazards CRC.

Following this fire, the South Australian Country Fire Service (CFS) commissioned the Bushfire and Natural Hazards CRC to undertake research into the community's bushfire experience focusing on bushfire safety, the CFS Community Fire Safe program and information and warnings. Researchers from CQUniversity completed the research, which was led by Dr Danielle Every.

The Sampson Flat fire was the most destructive in the Adelaide Hills for more than 30 years, burning 12,569 hectares of public and private land with losses including 24 homes, 146 other structures, five businesses and much livestock and fencing.

The report shows that although many people were well prepared for bushfire in the hills area, they struggled with the emotional strain the fire placed on them and their families.

It also showed some people had not undertaken any preparation and did not know what to do when threatened by a bushfire—this was a particularly common situation for people in the rural/urban interface.

The research is an integral part of the CFS's learning process, helping CFS understand how communities react to a bushfire and ensuring lessons learned will shape the future of CFS's ongoing engagement with communities before, during and after bushfire.

The report can be found at www.bnhcrc.com.au/publications/sampsonflat. ■

VICTORIAN CLADDING AUDIT HIGHLIGHTS REGULATORY FAILURE

The Victorian Building Authority has revealed that half of Melbourne's newest high-rises have had non-compliant flammable cladding installed, a result that indicates decades of regulatory failure and neglect of ongoing enforcement in Victoria.

Of the 170 buildings audited as part of the investigation, which was prompted by the Docklands Lacrosse apartment fire of November 2014, 51% were found to be non-compliant.

FPA Australia CEO Scott Williams said the results highlight a legacy of neglect by building authorities to educate the industry and enforce regulatory requirements.

"To have non-compliance at this level clearly shows that there has been no incentive for building practitioners to comply with the rules, and no enforcement to ensure they do so," he said.

"We are pleased these dangerous non-compliances have now been revealed, but this level of non-compliance of a single building element begs the question: what other non-compliances exist and why has ongoing auditing and enforcement not occurred as a routine program to monitor the industry?

"Victorians cannot have confidence that their buildings are safe and that is not good enough.

"The Association continues to echo the concerns of the MFB [Metropolitan Fire Brigade] about the massive, systemic regulatory failure that has led us to this point. Now that the full extent of these problems has been revealed in Victoria, we want to know what steps will be taken to ensure such an alarming level of safety risk never occurs again." ■

PHOTO: NATHAN MADDOCK, BUSHFIRE AND NATURAL HAZARDS CRC

Dr Andrew Edwards (left) measures the diameter of a tree killed by the fire, while Grigorijs Goldbergs (right) records the data.

TOP END TREES AND FIRE

A team of researchers has been gathering data on how high-severity fires in northern Australia can affect the health of trees.

In February, CRC researchers Adjunct Professor Jeremy Russell-Smith, Dr Andrew Edwards, Dr Kamalijt Sangha and CRC PhD student Grigorijs Goldbergs (all from Charles Darwin University), along with CRC Communications Officer Nathan Maddock, visited Mataranka Station in the Northern Territory to sample trees burnt by a high-severity fire in November 2015.

The team spent a very long, hot day gathering data on tree species, tree diameter and height and the status of each tree.

This last characteristic—tree status—was the most important, explained Dr Edwards.

"We need to know exactly how this type of fire affects the trees. Was the tree standing but dead, fallen over but dead or resprouting epicormically?" he said.

"We measured approximately 1,000 stems for the day," said Dr Edwards.

Preliminary indications show that this high-severity fire killed around half of the trees.

"Even by taking out the small size class of trees with a diameter of less than 10 cm, which can get knocked out by a moderate-severity fire, approximately 50% of the trees we measured were killed by this one high-severity fire. This is the information we need to know," explained Dr Edwards.

The data gathered will also feed into mapping tools and carbon sequestration information.

"The fire severity mapping uses satellite imagery across most of northern Australia," Dr Edwards said.

"I will be able to extract fire severity information for Mataranka Station for the November 2015 high-severity fire and calculate the proportion of the property that was affected. Aided by satellite mapping of the density of the trees, we can then estimate the tree loss on the station.

"This helps us model the proportion of trees killed, and therefore the amount of carbon lost due to high-severity fires in this type of landscape.

"We want to measure in enough places to create an algorithm to model this across northern Australia, which when applied to the fire severity model, tells a very powerful story," Dr Edwards said. ■

Kevin Farries from the University of Adelaide sets up the experiments.

EARTHQUAKE AND WIND TESTING IN ADELAIDE

PHOTO: MICHAEL RUMSEWICZ, BUSHFIRE AND NATURAL HAZARDS CRC

Earthquake and cyclone engineering combined in Adelaide during January to gather data on the construction of 1960s housing, all under the banner of Bushfire and Natural Hazards CRC science.

The University of Adelaide earthquake engineering research team was conducting experiments to find out how much displacement the walls of such housing can take before losing structural integrity. This was achieved by inflating airbags to apply pressure to the walls until their maximum strength was reached and significant cracking occurred. The data will inform modelling on predicting damage in the event of different scales of earthquake.

"It is rare that researchers get the opportunity to collect detailed measurements and do experimentation on real buildings that are typical of housing in at-risk natural hazard areas," said project leader Professor Michael Griffith of the University of Adelaide.

"The 1960s unreinforced masonry buildings are typical of the most at-risk buildings in the event of an earthquake. We are grateful to the Department of Transport, Planning and Infrastructure in South Australia for giving us access to these buildings scheduled for demolition in the next few months."

But why were cyclone and severe wind researchers in Adelaide? Dr Daniel Smith of the James Cook University Cyclone Testing Station was able to shed some light on what at first would appear to be an unusual opportunity.

"Adelaide may be better known for its bushfires and heatwaves than cyclones, but the buildings we are looking at are common along the Western Australian coast, and that coast is hit by more cyclones than the east coast of Australia," he said.

"So this was a valuable opportunity to understand the characteristics of a significant style of housing found in cyclone-affected areas, and use the information in our experimentation and modelling program," Dr Smith said.

The data gathered will greatly benefit both projects. ■

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NATIONAL MEMORIAL SERVICE TO HONOUR EMERGENCY SERVICES

PHOTO: AFAC

Attendees at the inaugural memorial service.

The emergency management sector will continue to recognise the sacrifice and commitment of its personnel by holding the second annual National Memorial Service.

The service will be held on Friday 29 April to pay respects to the fire and emergency services sector workers who have lost their lives while on duty. The event marks the second memorial and is an important step towards an annual day of recognition for the sector.

This year's service will again be held at Lake Burley Griffin in Canberra, where the National Emergency Services Memorial sits among the many memorials in Kings Park. Event attendees will include agency Commissioners, Chief Officers, Members of Parliament and invited guests.

The inaugural memorial service was held in May 2015 to honour and acknowledge the sacrifice of the men and women who had recently died. Nearly 300 family members, friends and colleagues of emergency services personnel and several members of parliament attended the service. This event commemorated the first public display of recognition for the fire and emergency services sector. ■

For more details please visit www.afac.com.au.

BUSY BUSHFIRE SEASON LAUNCHES SEVERAL INQUIRIES

The past summer has been a busy bushfire season in Australia with devastating blazes in Victoria, South Australia and Western Australia. All these fires burnt into townships, damaged property, and some tragically took lives. As a result several inquiries are now underway with findings due to be released later in 2016. AFAC has offered support to these inquiries at the request of our member agencies. The level of support ranges across these jurisdictions and includes independent advice, operational audits and advice to governments.

VICTORIA

The Victorian Inspector-General for Emergency Management, Tony Pearce, has completed a report on the fire that burnt 116 homes in the Victorian communities of Wye River and Separation Creek on Christmas Day. The report found that the available resources were allocated appropriately and that the decision-making process followed by authorities was acceptable in the circumstances.

In addition, the State Coroner for Victoria, Judge Sara Hinchey, has commenced an investigation.

SOUTH AUSTRALIA

After a fire spread rapidly on 25 November 2015 in Pinery, South Australia, claiming two lives, it was revealed that emergency communications systems had failed. Both the government radio network and the Telstra mobile network experienced failures while crews attempted to issue warnings and communicate with base.

The then-Emergency Services Minister for South Australia, Tony Piccolo, announced that an independent review would be undertaken. The review will include what can be done to improve communications networks in an emergency event.

WESTERN AUSTRALIA

In Western Australia a blaze that burnt into the townships of Yarloop and Waroona in early January 2016 is now subject to an inquiry. Two lives were lost and 160 properties destroyed as a result of the fire.

The inquiry is being led by the former Chief Officer of the Victorian Country Fire Authority, Euan Ferguson. Under the Public Sector Management Act 1994, Mr Ferguson has the powers of a royal commissioner and the authority to subpoena witnesses.

The review will include whether lessons learned from previous incidents were incorporated into the response.

TASMANIA

Parts of Tasmania's World Heritage Area were damaged by dozens of fires in January and February 2016, resulting in public calls for an independent inquiry into the government response.

The Tasmanian Premier, Will Hodgman, announced that a review would be completed, while the Australian Senate is also conducting an inquiry. AFAC is undertaking an independent operational review. Less than 2% of Tasmania's World Heritage Area was burnt by the fires. ■

NEW STANDARD ON FIRE PROPAGATION OF EXTERNAL WALLS—AS 5113

Standards Australia recently completed the development of AS 5113 *Fire propagation testing and classification of external walls of buildings*.

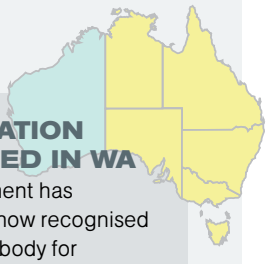
The Standard sets out procedures for testing and classification of external walls according to their tendency to limit the spread of fire across their surface and between neighbouring buildings. It can be applied to external vertical surfaces and external wall systems. AS 5113 also integrates international standard test methods where practicable.

According to the independent Chair of the Committee, Paul England, the expected outcomes for Australia are:

- improved fire safety through appropriate classification of the performance of external walls
- improved energy efficiency
- improved selection criteria for facade materials and systems for the building industry
- net saving on reducing compliance costs and facilitating the use of cost–effective facade systems.

"The Standard will facilitate quantification of performance in the area of fire safety consistent with ABCB [Australian Building Codes Board] initiatives. It will assist with the compliance of the energy efficiency requirements of the NCC [National Construction Code] while contributing to the maintenance of acceptable levels of public safety," said Mr England.

The Standard was prepared by Technical Committee FP-018 on Fire safety. This committee includes representatives from FPA Australia, other industry associations, fire authorities, testing laboratories and the ABCB. ■



BUSHFIRE ACCREDITATION LEVELS 2 AND 3 ADDED IN WA

The Western Australian Government has announced that FPA Australia is now recognised as a Level 1, 2 and 3 accrediting body for bushfire practitioners operating in Western Australia. The State Government is committed to developing a professional training and accreditation system for bushfire practitioners to inform land use planning and building decisions in bushfire-prone areas. FPA Australia has been working closely with the Western Australian Government to support the implementation of the recently released bushfire reforms. The accreditation scheme supports the planning and building bushfire reforms, including the map of bushfire-prone areas, building regulations, State Planning Policy 3.7—*Planning for Bushfire Prone Areas and Guidelines* and Local Planning Scheme Amendment Regulations 2015. ■

CRC PhD students will gain valuable emergency management experience though the Student Placement Program.

PLACEMENTS TO PROVIDE VALUABLE LEARNING

The Bushfire and Natural Hazards CRC has launched an exciting new initiative to provide CRC PhD students with emergency management workplace experience.

The CRC's Student Placement Program is seeking end user organisations to partner with a student undertaking relevant PhD research. The program will allow CRC PhD students to build a close relationship with at least one CRC partner by working with them, and allow end user partners an opportunity to engage with CRC students and better understand the research that they are undertaking.

The CRC Education Manager, Lyndsey Wright, said the program will provide many benefits for both students and end users.

"This opportunity will link students with end user organisations who are interested in the research underway.

"Not only will the organisation and its staff gain valuable insights into how the PhD research could benefit them, CRC students will learn more about the day-to-day activities that emergency managers undertake, which will help them greatly, both now while they are completing their studies, as well as post-PhD," she said.

For more details about how you and your organisation can be involved in the Student Placement Program, email lyndsey.wright@bnhcrc.com.au. ■

INTERNATIONAL PANEL ENSURES RESEARCH QUALITY

The Bushfire and Natural Hazards CRC has appointed an International Science Advisory Panel to help oversee its research program. The panel will provide independent strategic advice on the quality and overall development of the CRC's research and education programs to ensure the research is of high quality.

The panel comprises four members from various research programs in Australia and overseas: Professor Carmen Lawrence (Chair, University of Western Australia), Professor Kathleen Tierney (Director of the Natural Hazards Centre, University of Colorado), Dr Mark Finney (US Forest Service) and Dr Anthony Bergin (Deputy Director of the Australian Strategic Policy Institute).

The expertise of the panel members covers physical science (Dr Finney), resilience (Professors Lawrence and Tierney) and policy (Professor Lawrence and Dr Bergin).

CRC Research Manager Dr Michael Rumsewicz said the panel will be of great value.

"Our research program will benefit from the oversight of Professor Lawrence, Professor Tierney, Dr Finney and Dr Bergin, who are all leaders in their fields," Dr Rumsewicz said. "The panel will review both the quality and scientific rigour of the research outputs while also providing an international perspective on its quality and scope. This process is critically important as we refine our research program over the next 18 months." ■

INTERNATIONAL SCIENCE ADVISORY PANEL MEMBERS

(Chair) PROFESSOR CARMEN LAWRENCE, School of Psychology, University of Western Australia, has previously conducted research for the Bushfire CRC, examining community preparedness.

PROFESSOR KATHLEEN TIERNEY, Professor of Sociology and Director of the Natural Hazards Centre, is part of the Environment and Society Program in the Institute of Behavioural Science at the University of Colorado.

DR MARK FINNEY, Research Forester with the Fire, Fuel and Smoke Science Program, US Forest Service, has 25 years of experience in fire research.

DR ANTHONY BERGIN, Deputy Director of the Australian Strategic Policy Institute, has undertaken roles including looking at national security from an all-hazards perspective and disaster management planning.

PHOTO: PAUL HESSE

Burnt dunes near Lake Quallilup, WA.

FIRST GRANT CAPTURES IMPORTANT DATA

The Bushfire and Natural Hazards CRC has issued the first grant to help researchers gather important data from disaster-affected regions, following the establishment of the Quick Response Fund in late 2015.

Macquarie University's Dr Paul Hesse lead a small team that travelled to Esperance in Western Australia to determine whether the bushfire in that area in November 2015 will lead to destabilisation of coastal sand dunes.

Dr Hesse explained that the fieldwork focused on the relationship between bushfires, coastal vegetation and sand dunes.

"We wish to understand if bushfires have the capacity to result in reactivation of coastal sand dunes. It is well known that disturbance to stabilising vegetation is one of the key causes of dune reactivation, which has the potential to threaten roads, towns and agricultural land," he said.

The results will be reported to the CRC and will form part of a Masters thesis for Macquarie University's Sam Shumack.

The Quick Response Fund is available to assist research teams travel to areas affected by natural disasters such as bushfire, flood, cyclone, severe storm, earthquake and tsunami to gather an immediate understanding of the event and capture perishable data. Funding is available for up to $2,500 (including GST) per team, per event. It is principally designed to reimburse travel-related expenses such as airfares, car rental and accommodation.

Applicants do not need to be current CRC researchers to be eligible. PhD students are also eligible to apply where an understanding of the event directly relates to their PhD studies.

For more information visit www.bnhcrc.com.au/about/opportunities

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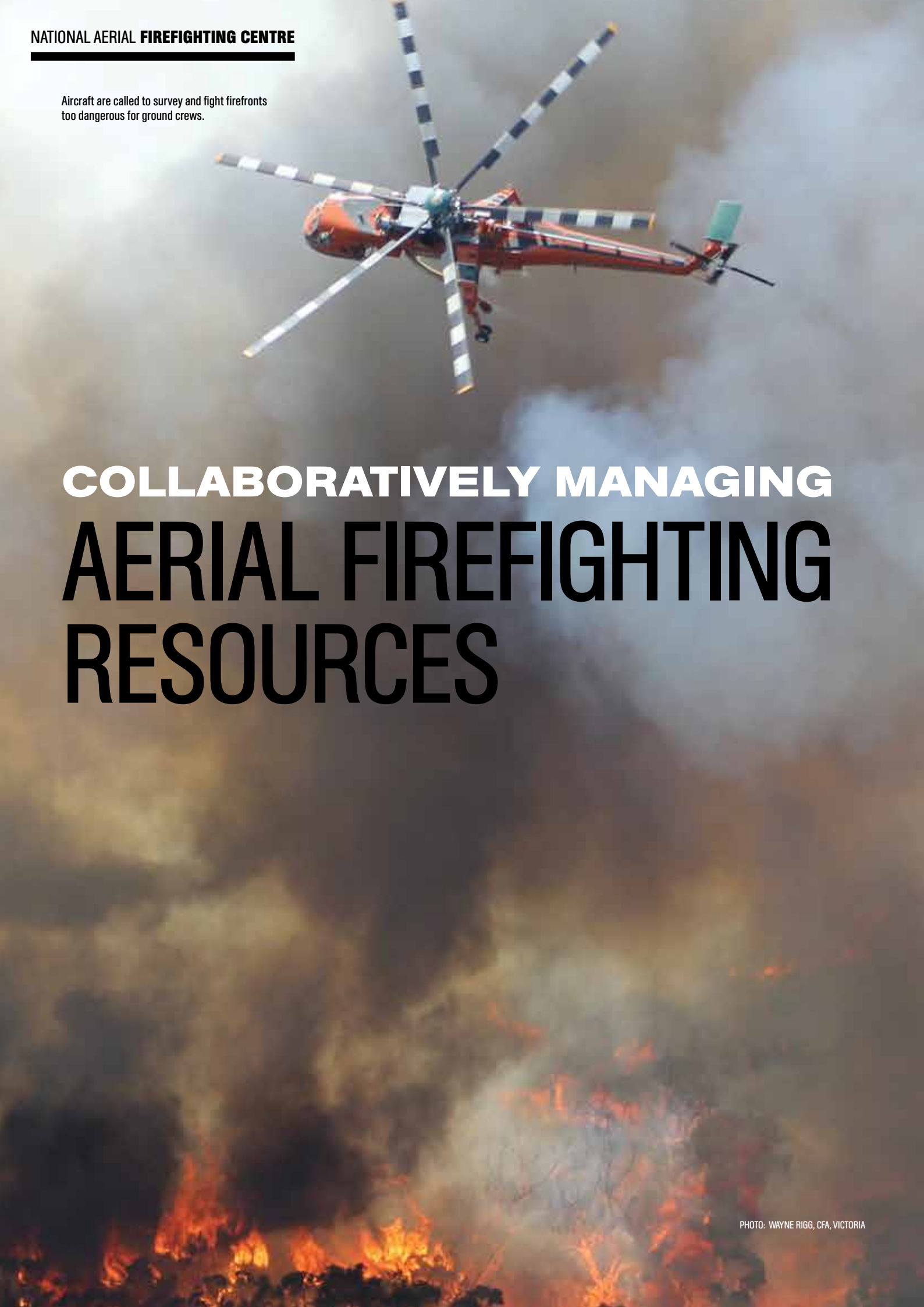

Aircraft are called to survey and fight firefronts too dangerous for ground crews.

COLLABORATIVELY MANAGING

AERIAL FIREFIGHTING RESOURCES

PHOTO: WAYNE RIGG, CFA, VICTORIA

The reality of firefighting is that it is a complex science. Now more than ever aerial operations are needed to assist resources on the ground. The National Aerial Firefighting Centre supports aerial firefighting capabilities through its collaborative approach to resource management.

BY **FREYA JONES**

Since its formation in 2003, the National Aerial Firefighting Centre (NAFC) has facilitated the sharing of crucial aerial firefighting resources among Australian states and territories. Its core role involves coordinating the lease agreements and contracting a national fleet of highly specialised aircraft that emergency services and land management agencies across Australia rely on during the fire season. While aerial firefighting on its own is not normally effective in completely extinguishing fires, when deployed in cooperation with on-the-ground firefighters, it can prove vital.

As well as providing important aerial support during fires, the fleet of aircraft is able to offer operational support for a range of other natural hazards, such as flood and storm mitigation and recovery activities.

The specialised fleet of firefighting aircraft are sourced by NAFC on a lease basis from high-quality operators around the world and a public tender process is used to manage aircraft procurement. State and territory experts conduct extensive risk assessments prior to and during the fire season to determine how aircraft are best positioned across the country. The growing trend towards longer fire seasons has at times posed a challenge for NAFC in managing resources, with many of the larger aircraft coming from overseas for the fire season.

Because of the cost of these highly specialised aircraft it is not economically feasible for every state and territory to host the full range of aerial capabilities during the fire season. Instead NAFC fosters a national arrangement among all states and territories, which allows aircraft to be readily shifted across the country as high-risk fire conditions develop. By facilitating the sharing of these aerial resources, agencies are provided with increased capacity to respond to fires and valuable access to aerial support that would otherwise be unavailable.

The General Manager of NAFC, Richard Alder, said the organisation works closely with its members, made up of Australia's state and territory emergency management agencies, to best meet everyone's needs.

"It's a complex map of stakeholders and I'm proud of the work the NAFC team does to deliver better support to our members."

> "The collaborative approach to ARENA will deliver a cohesive, integrated national information system that all our stakeholders can use to help with effective and efficient application of aviation resources across the country."
>
> – Richard Alder, General Manager NAFC

PHOTO: DEPARTMENT OF FIRE AND EMERGENCY SERVICES, WESTERN AUSTRALIA

NAFC procures a range of aircraft to ensure the right aircraft is available for each operation.

PHOTO: WAYNE RIGG, CFA, VICTORIA

Fixed wing aircraft provide a range of support, including dropping retardant.

"The sophisticated way in which the fleet is moved around the country is a reflection of the collaborative approach and the goodwill shown by all. We have come a long way in a short time."

– Richard Alder, General Manager NAFC

The current fleet of more than 120 aircraft includes large helicopters (such as the well-known air crane), fixed-wing firebombers and water scoopers. This year the fleet also included four large fixed-wing air tankers. It's early days for large air tankers in Australia but they could prove to be a game-changer in aerial firefighting. The sophisticated large air tankers offer speed and flexibility, which allows them to deploy quickly across the country and operate within several jurisdictions during the one day. Not all aircraft are effective in every situation, and for this reason NAFC procures and maintains a mix of specialised aircraft to provide the flexibility agencies need to respond to a wide range of events.

NAFC's highly cooperative model has seen contracting of aircraft transition from a state-based responsibility to a centralised system, made possible with the support of the Australian Government. In 2015–2016 the Australian Government provided $15.38 M in essential funding towards the standing costs of the fleet, with state and territory governments meeting operating costs and the remaining fixed costs.

"Without the support of all levels of government, both tangible and intangible, NAFC could not operate," said Mr Alder.

Mr Alder said the successful model has been instrumental in supporting fire, emergency services and land management agencies and, most importantly, in saving lives and property throughout many bushfire seasons and emergency situations."

Enter ARENA—a comprehensive support system for aerial resources

A major milestone for NAFC has been the creation and implementation of ARENA, a collaborative national information system to support the management of fire and emergency aviation. The first stage of ARENA, rolled out during 2015, provides users with a national registry of aircraft, operators and people.

The ground-breaking and innovative system was developed in conjunction with NAFC's members and delivers convenient access to a single source of consistent, quality-managed information. ARENA engages cloud-based architecture that allows users to access information from a range of devices and locations.

Mr Alder said the system offers a unique opportunity for the industry.

"In practice, the collaborative approach to ARENA will deliver a cohesive, integrated national information system that all our stakeholders can use to help with effective and efficient application of aviation resources across the country."

Since its release, ARENA has clocked up more than 1,100 registered users and now records the details of more than 550 aircraft, 950 pilots and 180 aircraft operators.

ARENA reduces administrative business processes and streamlines communication among all stakeholders. Providing one tool for all jurisdictions, the system maintains high-quality data on the movement of the fleet and the operators and pilots.

Perhaps one of the most important features of ARENA is its ability to integrate data from a range of other systems including existing agency information management systems. Many additional functions for the system are currently being developed, such as daily service readiness, resource availability and fleet preparedness.

NAFC is committed to the ongoing development of ARENA—as its functionality and user numbers grow its value to the sector will continue to drive efficiencies, collaboration and positive outcomes for Australian communities. ■

Find out more at www.nafc.org.au and https://arena.nafc.org.au.

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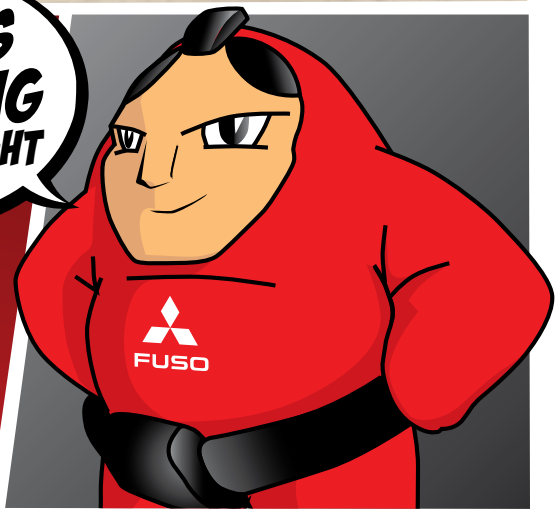

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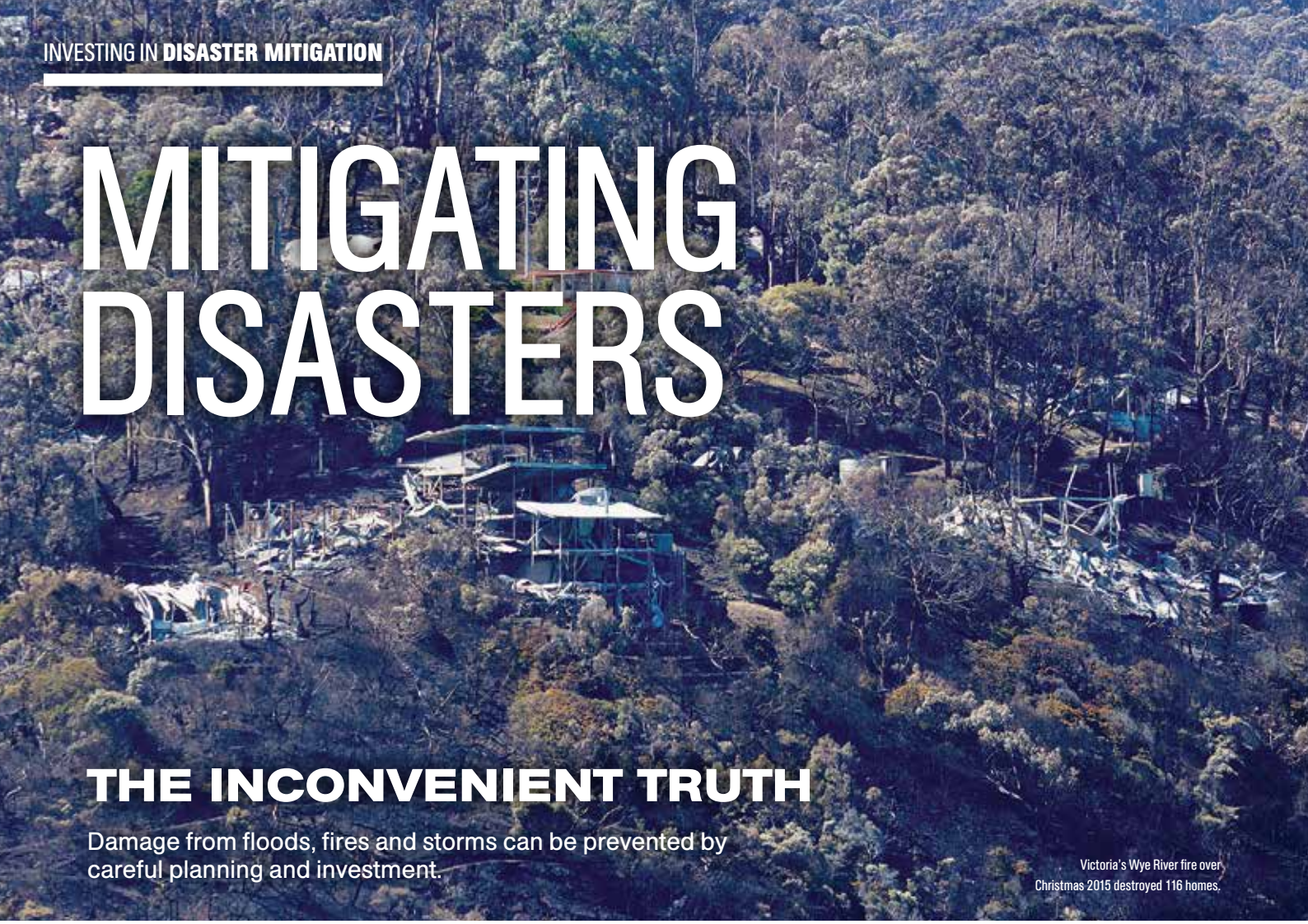


THE INCONVENIENT TRUTH

Damage from floods, fires and storms can be prevented by careful planning and investment.

Victoria's Wye River fire over Christmas 2015 destroyed 116 homes.

PHOTO: KEITH PAKENHAM, CFA.

BY **DR RICHARD THORNTON**

Chief Executive Officer, Bushfire and Natural Hazards CRC

During the past bushfire season, public commentary focused on how major bushfires were managed in several states. Were warnings adequate and who knew what and when?

In some parts of the country, the fires came early (Victoria, South Australia and Western Australia). In others it was floods (New South Wales, Queensland and the Northern Territory), and severe storms battered Queensland and NSW.

Lives and properties were lost in many of these events, which is tragic. What is doubly tragic is the mounting cost of response and importantly recovery, because in that one word—recovery—lies the heartache of loss and destruction.

There is growing research highlighting an increase in social problems following a disaster, including increased alcohol consumption, an increase in domestic violence and a greater incidence of suicide.

The Federal Government's Productivity Commission, in its inquiry into disaster funding arrangements in May 2015, made strong recommendations that the focus for emergency management had to switch to mitigation.

Mitigation is always a better option, as not only does it ultimately reduce the dollar costs, it also reduces misery and suffering following the disaster. But what does this mean in practice?

For bushfire, this clearly means mitigating the intensity of fire through the use of fuel reduction on public and private land, with communities and officials accepting the risks and inconveniences of fire during autumn and spring.

There is a need to maintain the right amount of land burnt before fuel loads get to levels that make future management difficult. Commentators say that not enough controlled burning is being done in some jurisdictions.

For cyclone and flood, this means mitigating wind and water damage through the construction of better infrastructure such as dams, levees or community cyclone shelters. For homeowners, this means better building and rebuilding of homes, and ensuring that existing houses have simple and cost-effective mitigation measures.

To illustrate the point, a recent study by Suncorp, Urbis, The Green Cross and The Cyclone Testing Station at James Cook University found that 86% of claims arising from 2011's Severe Tropical Cyclone Yasi were for minor damage, which could have been easily and cheaply prevented.

It was shown that some roof upgrades to older houses could pay for themselves after just one cyclone. This is why a focus on retrofit options for existing households is such a cost-effective approach to dealing with various hazard types.

We must question whether building in some areas is wise. It may be best not to rebuild in some areas because the risk is unacceptably high.

There is a critical need for discussion around land use planning and land management, and how and where we develop new areas with roads, bridges and other infrastructure. This is crucial in the renewed push to open northern Australia.

The bottom line here is that all Australians need to accept and understand that we live in a country where natural perils exist and that the management actions required to maintain our comfortable lives are sometimes inconvenient and come with

their own risks and costs.

Better understanding the consequences of our actions and, importantly, inactions, will be a critical part of this.

Increased levels of smoke and the risk of escape from greater prescribed burning, increased planning controls and enforcement, and increased personal costs of compliance, will have to be part of our way of life if we are truly to meet the desired outcomes of increased mitigation.

One challenge here is that evidence shows little political capital is to be gained from mitigation.

In fact, research from the US shows that it could be politically damaging; there is no photo opportunity, and all we see is the cost of the mitigation action itself. We do not see the savings from all the events that did not happen. We can only see the payback from our expenditure in future trendlines that are only weakly correlated to the specific actions.

As the then-Secretary General of the United Nations, Kofi Annan, stated in 1999: "Building a culture of prevention is not easy. While the costs of prevention have to be paid in the present, its benefits lie in a distant future. Moreover, the benefits are not tangible; they are the disasters that did not happen."

To reduce the pain, suffering and cost, we all need to commit to a mitigation approach and to accept the risks and stop the blame game when things go wrong or are inconvenient. ■

This opinion piece originally appeared in the *Australian Financial Review* on 13 January 2016.

> "Mitigation is always a better option, as not only does it ultimately reduce the dollar costs, it also reduces misery and suffering following the disaster. But what does this mean in practice?"
>
> – Richard Thornton, CEO of the Bushfire and Natural Hazards CRC

A flooded road in Morayfield, Queensland, in the aftermath of Cyclone Marcia in February 2015. Better infrastructure can mitigate water damage from floods and cyclones.

PHOTO: SHUTTERSTOCK.COM

DELIVERING POSITIVE OUTCOMES

FIRE AUSTRALIA + HAZMAT 2016—RISK, LIABILITY & EXPOSURE

4+5 MAY 2016, MELBOURNE CONVENTION & EXHIBITION CENTRE

Fire Australia + HazMat 2016 will be the largest conference and tradeshow in Australia dedicated to providing the latest information, research and knowledge for all stakeholders involved in the fire protection and hazardous materials industries.

BY **JOSEPH KELLER**

Communications Manager, Fire Protection Association Australia

Traditionally run as separate events, Fire Australia and HazMat are combining to create Fire Australia + HazMat 2016. We're bringing you a bigger and better conference and free tradeshow by combining these two sectors under one roof for the first time. The event will attract key industry professionals from the fire protection, fire safety, emergency management and hazardous materials sectors from across Australia and overseas, as well as representatives of government, fire and chemical management agencies.

Conference

Fire Australia + HazMat 2016 will bring you key influential speakers from across Australia and overseas—attending this event is a must for fire and hazardous material personnel.

The conference aims to ensure all presentations are topical, affording attendees valuable knowledge and information on present and future industry issues, products and legislation.

Conference presentations will be divided into three streams:

- Fire protection strategic stream—*Risk, Liability, Exposure*
- Fire protection technical stream
- HazMat stream.

Tradeshow

The tradeshow will once again be a main feature of the event. It will be located central to all activities including the catering and café seating areas and the Showcase Theatre.

The tradeshow is expected to attract more than 1,000 visitors with free entry, a huge display of products and services from national and international

KEY DATES AND TIMES

CONFERENCE

Wednesday 4 May 8.45 am – 5.00 pm
Thursday 5 May 10.00 am – 4.00 pm

TRADESHOW

Wednesday 4 May 8.00 am – 5.00 pm
Thursday 5 May 9.00 am – 3.00 pm

The 2016 Tradeshow will be the largest ever.

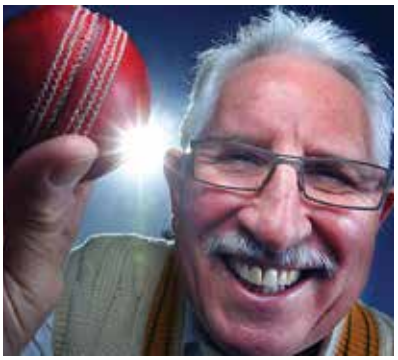
WHO WILL BE THERE? TRADESHOW EXHIBITORS

The 2016 industry-leading organisations and businesses that will be at the tradeshow include:

- 3M
- Advanced
- AFT Australia
- Alan Wilson Insurance Brokers
- Amare Safety
- AMPAC Safety
- AMPAC Technologies
- Antec Group Pty Limited
- Beijing Tianhai Industry Co
- BOSS Fire & Safety
- Branz
- Brooks Australia Pty Ltd
- Chemical Safety International
- Chubb Fire & Security Pty Limited
- Greene Fire
- CSIRO
- Design Integrity Solutions
- Exova
- Falck
- FFE UK
- Fire Protection Association Australia
- Fire Factory AU
- Fire Protection Technologies
- Fire Rating Solutions
- Fire Safety Devices
- Fire Security
- Fire Sense
- FireMate Software
- Fireworld Australia
- Firex
- FlameStop Australia
- Gas Clip Technologies
- Hochiki Australia
- Honeywell
- Ignis Fire
- International Paint
- Jiangxi Besta
- Kidde Australia
- LAF Group
- Lorient Pty Ltd.
- Mpower
- NBN co.
- Ningbo Siterwell Electronics Co.
- Pertronic Industries Pty Ltd
- Promat Australia
- Rhino Water Tanks
- Snap Fire Systems
- Solberg Asia-Pacific
- Speedpanel Australia
- Suzhou Plastic
- TBA Textiles
- The Tank Inspectors Pty Ltd
- Total Eden
- Tyco Fire Protection Products
- UL international Australia
- Victaulic
- Weifang Changsheng Pipe
- Xtralis now part of Honeywell

Plus more to be announced.

More than 80 exhibition booths will showcase industry-leading products and services.



Max Walker will MC the charity dinner.

businesses and the chance to win prizes each day. The tradeshow is a must-see for anyone with an interest in fire protection and hazardous materials.

Why attend?

With so many exhibitors under the one roof, the tradeshow allows you to gain an overview of the latest innovations from local and global manufacturers to ensure you're up to speed with what your competitors are doing.

Showcasing the latest technology, innovations and products to reach the market, the tradeshow is a valuable opportunity to talk one-on-one with manufacturers and business representatives.

Networking opportunities

The conference and tradeshow attract key stakeholders, decision-makers and industry personnel from a variety of professions across Australia, New Zealand and the Asia–Pacific region, providing you with valuable networking opportunities.

Showcase Theatre

A major drawcard of the tradeshow is the Showcase Theatre—a dedicated space for exhibitor and sponsor presentations, and a variety of special technical presentations. This free education program will offer you invaluable insight into the key areas of development for the fire protection industry.

TWO CHANCES TO WIN $300

1 Attend any presentation in the Showcase Theatre over the two days to be in the draw for $300.

2 Attend the tradeshow and complete a form on the day, to nominate your choice for 'People's choice for best exhibitor' and you'll be in the draw to win $300.

Winners for both draws will be contacted if they are not present at the time of drawing.

FEEDBACK FROM 2015 CONFERENCE & TRADESHOW ATTENDEES

"Given the nature, seriousness and level of industry engagement the tradeshow was great."

"This was my first experience at an FPA Australia conference and I was very impressed. I will be coming back."

"I'll be coming back next year. The tradeshow was good, the networking and the free presentations made it worth the trip. The FPA Australia staff were all excellent."

The iconic Melbourne Cricket Ground will play host to this year's charity dinner.

Melbourne Convention & Exhibition Centre

The Melbourne Convention & Exhibition Centre (MCEC) is a world-class facility with remarkable spaces and leading technology. The centre is in the heart of the South Wharf, Crown Casino and Southgate retail, entertainment and dining precincts. Melbourne's famous food venues, cafés and alleyways are all just a short stroll away.

The MCEC is conveniently positioned, with on-site car parking and easy access to trams, buses and trains. Melbourne International Airport is also only a 25-minute drive away.

For things to do in and around Melbourne, go to: **www.thatsmelbourne.com.au** and **www.visitmelbourne.com**.

Keynote speakers

Outstanding keynote speakers from Australia and abroad have been confirmed for each of the three streams.

Fire protection strategic stream

- **Craig Lapsley**—Commissioner, Emergency Management Victoria
- **Bronwyn Evans**—CEO Standards Australia
- **Greg Kelly**—GKA Investigations Group, CEO & Chief Fire Investigator
- **Donald P Bliss**—Vice-President for Field Operations, National Fire Protection Association
- **Christopher Kerin**—Legal Practitioner, Director, Kerin Benson Lawyers Pty Ltd

Managing risk and limiting liability and exposure are daily challenges shared by everyone involved in fire protection. Essential to managing these risks is to identify areas of vulnerability, ensuring appropriate strategies and systems are in place to prevent things from going wrong and understanding the possible consequences should systems fail. Presentations in this stream will consider:

1. The risk of fire—exploring opportunities to improve the protection of life, property and the environment
2. Business risks—such as financial, personal and reputational risk to business owners, their employees and their customers.

Fire protection technical stream

- **Brett Staines**—Chair of Special Hazards Fire Protection Committees, Fire Protection Association Australia and Standards Australia

The Fire Protection Technical Stream will deliver technical knowledge, information and research on early warning and detection, fire suppression, passive fire protection, emergency planning, bushfire, maintenance and product testing and approval.

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LANYARDS

Brooks fire • evacuation • warning systems

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CAFE CART

Fire Security Services

HAZMAT SUPPORTING ORGANISATIONS

APMF Australian Paint Manufacturers' Federation Inc.

AIDGC

DGAG

NSW Fire & Rescue NSW

MFB

safe work australia

HazMat stream

- **Peter Schmidt**—Emergency Management Victoria
- **Paul Taylor**—Safe Work Austrlaia Director of Occupational Hygiene
- **Giles Hobson**—National Chemical Emergency Centre (UK) Business Manager
- **Paul Johnstone**—Fire & Rescue NSW Superintendent

The stream will deliver up-to-date, best-practice knowledge for individuals in the chemical management, dangerous goods and hazardous materials industries regarding chemical management and safety, emergency management and response, and transport, storage and handling.

Panel session

Don't miss this interactive session inviting the audience to participate with panellists in a Q&A session to explore the concepts and discuss the ramifications for the industry and community. Scheduled for after lunch on day two (5 May), Matthew Wright, FPA Australia Chief Technical Officer, will set the scene with our panel of professionals from diverse backgrounds sharing experiences and opinions.

The topic for this exciting panel discussion is 'Australia's Building Control System—Functional or Flawed?'

Join the disicussion with our panel of experts as they debate whether Australia's building control system delivers efficient and effective outcomes or is an industry in crisis, moments from disaster?

Panellists

- **Christopher Kerin**—Legal Practitioner, Director, Kerin Benson Lawyers
- **Greg Kelly**—Principal Forensic Fire Examiner, Managing Director, GKA Investigations Group
- **Stephen Kip**—Registered Building Surveyor and Fire Safety Engineer, Skip Consulting
- **Donald P Bliss**—Vice-President Field Operations, National Fire Protection Association, USA
- **Michael Lambert**—Independent Reviewer, *NSW Building Professionals Act 2005*
- **Neil Savery**—General Manager, Australian Building Codes Board

Charity dinner

As always, the charity dinner will be an entertaining evening of great food, fun and networking within your industry. The dinner will be held at the Melbourne Cricket Ground (MCG). Featuring guest speaker and MC Max 'Tangles' Walker, as well as live entertainment, it promises to be a very entertaining evening!

FPA Australia is serious when it comes to supporting our charities. We are pleased to announce this year's charity as the Fiona Wood Foundation.

As part of our support for the Fiona Wood Foundation, the charity dinner will host a fundraising auction, with all proceeds going to the Foundation. A range of unusual items will up for grabs on the night, going to the lucky highest bidder. Competition is sure to be hot, so check the website for updates on auction items, and bring your wallet!

Date: Wednesday 4 May 2016
Time: 6.30 pm for 7.30–11.00 pm
Venue: MCG Members Dining Room
Dress: Smart semi-formal, or dress your group in a sports theme or as a favourite athlete—prizes will be awarded for the best group and best individual
Tickets: $160 per person
Please note: Tickets are not included with conference registration and must be purchased separately before the function. See the included registration form.

Your ticket includes pre-dinner drinks, a three-course meal accompanied by a selection of wines, beer and soft drinks, entertainment and the charity auction for the Fiona Wood Foundation. ■

Get involved in the Fire Australia + HazMat Conference & Exhibition! Visit: www.fireaustralia.com.au.

PROCEDURAL FAIRNESS IN THE WORKPLACE

Many readers of *Fire Australia* magazine are employers or employees in organisations such as fire protection companies, councils, facility management companies and emergency services agencies, among many others. In this article FPA Australia Workplace Relations Manager Richard Krajewski explains the responsibilities employers in Australia have to ensure procedural fairness in their workplaces.

BY **RICHARD KRAJEWSKI**

FPA Australia Workplace Relations Manager

Generally speaking, the right to natural justice carries with it the right to a fair hearing without bias. In the context of a fair hearing, a person must be given notice of the case and be given a fair opportunity to answer the case put, as well as being given the opportunity to present a case—Queensland Civil and Administrative Tribunal

(Legal Services Commissioner v Foster [2015] QCAT 214).

The same can be said with respect to workplace issues and matters—the right to be heard. Procedural fairness therefore applies to performance issues and employee conduct, and the approach may affect the desired outcome.

What is natural justice and procedural fairness?

The courts have developed 'rules of natural justice' that have gradually evolved into a reference for the requirement of procedural fairness.[1]

The natural justice and procedural fairness rules involve two related issues. Is there a duty to afford natural justice or procedural fairness to an individual (or group)? What is required by the rules of natural justice and procedural fairness?

Natural justice has traditionally been seen to require: (i) granting of a hearing to a potentially affected party; and (ii) granting of a hearing by a disinterested decision-maker. **Procedural fairness** requirements are similar but potentially broader because it may involve more than a hearing by an unbiased decision-maker, and narrower because the relatively low threshold for being entitled to procedural fairness may mean some cases can be said to have procedural fairness, notwithstanding the absence of a hearing or that the decision was made by a decision-maker with some interest in the outcome of the case.

Performance

Applying the same principles to the workplace, proper and fair management of poor performance and misconduct are critical in an employment relationship.[2]

At the core of any performance procedure is the concept of 'natural justice', which means giving the employee a proper opportunity to be heard on any performance or conduct issue. However, the concept also includes points, which can be treated as a guide (and a checklist):

- ensuring that employees are aware of the employer's expectations and standards for conduct and performance
- ensuring that these expectations and standards are reasonable and achievable
- providing employees with proper guidance (and sometimes training) and support to meet these expectations/standards
- raising any poor performance or conduct as soon as an issue arises
- dealing with issues in a professional manner
- giving employees warnings and a reasonable time to meet performance and conduct standards
- setting reasonable targets and goals
- giving employees a proper right to be heard before final decisions are made
- properly investigating any disputes about performance or conduct
- ensuring employees are provided with support during stressful meetings
- ensuring that the decision-maker has the benefit of considering all the relevant details that form the basis of the allegation or decision
- acting consistently and ensuring that the disciplinary action is commensurate to the employee's failure to meet standards.

However, if one of these factors is missing it will not necessarily mean that the process is unfair.

Fair Work Act

The *Fair Work Act 2009* (Cth) also provides insight into procedures when dealing with, for example, unfair dismissals. Section 387 sets out the criteria that the Fair Work Commission needs to take into account when considering whether a dismissal was harsh, unjust or unreasonable. The relevant paragraphs in section 378 (B,C,D,E) with respect to procedural fairness are (in summary):

B. whether the person was notified of that reason (for the dismissal)

C. whether the person was given an opportunity to respond to any reason related to their capacity or conduct

D. any unreasonable refusal by the employer to allow the person to have a support person present to assist at any discussion relating to dismissal

E. if the dismissal was related to unsatisfactory performance.

It is clear from an industrial perspective that tribunals will give prominence to procedure and fairness. But the Fair Work Commission (and its predecessors) are required to act promptly and effectively—a right to be heard and the rule against bias.[3]

Where an employer has decided on the need for genuine redundancies, criteria to be considered include:

- special needs of the type of work the employer may require
- ability, special skills and experience
- self-motivation, productivity and ability to work without supervision
- attendance and punctuality
- adherence to procedures
- seniority—length of service will not be the only criteria
- reliability
- discipline.

Dispute resolution

Dispute and grievance procedures also set out steps to be followed to try to resolve a dispute or grievance. Commencing with an attempt to resolve the issue at the earliest stage to the escalation of the dispute or grievance through added steps involving internal and external participants, a dispute procedure and/or a grievance procedure sees all participants have opportunities to respond and contribute to the issues and/or grievances.

This can also involve outside parties such as the Fair Work Commission and the Australian Human Rights Commission.

Conclusion

Procedural fairness is important within the workplace. Failure to provide such steps and opportunities can damage the desired outcome.

Situations can arise that require attention to procedure and to fairness. Ranging from performance management to dealing with conflict, all require applying fairness and justice. While managerial prerogative is not questioned, a fair approach accompanied by documentation helps gain a more satisfactory outcome, including the effect upon the workplace. ■

Disclaimer: This article is not legal advice. While every care has been taken in preparing it, no responsibility will be accepted by the author or publishers for actions taken in reliance upon information contained in this article.

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REMOTE SENSING
FLOOD DATA IS FILLING THE GAPS

Floods account for some of the worst natural disasters in Australia, costing millions of dollars in damage each year and devastating communities. Research is testing a new approach to flood forecasting using satellite technology, which could help better mitigate these disasters.

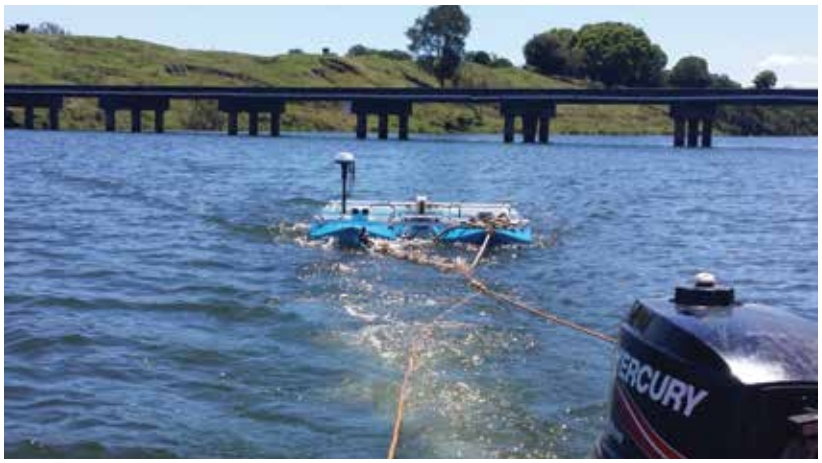


PHOTO: STEFANIA GRIMALDI

Measuring the bed of the Clarence River using a HydroSurveyor near Rogans Bridge, NSW.

PHOTO: NSW STATE EMERGENCY SERVICE, CLARENCE NAMBUCCA REGION

Above: The Clarence River has flooded areas around Grafton, NSW, four times since 2009, significantly affecting many rural properties, such as this one in February 2013.

BY **FREYA JONES**

Predicting water depth and its velocity is key for timely and accurate flood forecasts, and Bushfire and Natural Hazards CRC research along the Clarence River in northern New South Wales has recently completed a survey to improve flood forecasting in the area.

Using a HydroSurveyor, including an echo sounder, Doppler velocity profiler and GPS antenna, the research team has built a three-dimensional map of the river bed, which can be maintained as conditions change.

This is a significant benefit for the Clarence Valley and will be used to calculate the capacity of the river to deal with incoming flows, said Associate Professor Valentijn Pauwels, who is leading the Bushfire and Natural Hazards CRC project Improving Flood Forecast Skill Using Remote Sensing Data.

"With this information we can predict water depth and velocity at any point in the river valley," said Associate Professor Pauwels.

"The availability of timely and accurate flood forecasts will allow for time-effective warnings, the implementation of evacuation plans and the set-up of safe recovery and storage areas," he added.

This forecasting relies on data to predict the arrival time, water depth and speed of a flood using two main models, hydrologic and hydraulic. Associate Professor Pauwels said the models each predict different aspects of a flood that are then applied together.

"The hydrologic model determines the flow of water that is entering a river network using rainfall and catchment conditions, while the hydraulic model predicts how that water will travel downstream along the river system," he said.

Although these models have come a long way in terms of capabilities, they do not yet provide all the answers.

"It is challenging to provide accurate flood warnings because of errors or uncertainties in the model structure and the model parameters," said Associate Professor Pauwels.

Combining satellite remote sensing data

This is where remotely sensed data may be applied to improve the accuracy of predictions.

The research is looking at how remotely sensed data can be assimilated operationally within existing models to improve the accuracy of flood forecasting. Remote sensing uses satellite technology to capture information about a particular area from far afield. This means that for regions that are dangerous or inaccessible at ground level, aerial data can be collected to fill in the gaps and aid predictions.

Behind flood forecasting is a complex science that is constantly adapting to new technologies. The current models

rely on rainfall stations to measure the amount of rainfall on particular catchments. The hydrologic model then calculates how much of that rainfall will be absorbed by the soil depending on current soil moisture levels. The Bureau of Meteorology's Manager of Policy and Strategy, Soori Sooriyakumaran, is one of the project's lead end users. He explained that there are particular limitations with the existing methods.

"There are parts of Australia where our rainfall station coverage is quite sparse due to the area being large and remote," he said. "Remotely sensed rainfall data will help understand the rainfall variability across such areas."

"Remotely sensed data also has its own problems, but even with those it can add value to the input that goes into the modelling," Mr Sooriyakumaran added.

Remotely sensed soil moisture products have a great potential for calibrating and updating hydrologic models—remote observations of flood extent and water levels can be used to correct and constrain in real-time the prediction of the flooded area and depth generated by the hydraulic model.

A challenge to the project lies in combining the satellite data with data collected on the ground in a way that will minimise errors.

"The spatial and temporal resolutions with which the on-ground and remotely sensed data are observed are different so there are some challenges in bringing them together," Mr Sooriyakumaran said.

To overcome this challenge and to minimise overall errors when combining the datasets, error characteristics of the data are analysed, with the desired goal more precise and robust outcomes for flood forecasting and flood warnings.

"What we are trying to do with this research project is to come up with the best combination of satellite and ground data so that we can have as accurate as possible input and constraint into the modelling."

The application of remotely sensed data can be compared to a missing piece of the puzzle for flood forecasting, joining together information from different sources to form the bigger picture. Mr Sooriyakumaran said this technology would only improve over time.

"Satellite remote sensing is an expanding new field, and we are going to have better and better data coming through in the future with higher resolution and higher frequency. This is one of the technologies that is going to keep improving flood forecasting into the future."

Geoscience Australia is also an industry partner in the project, providing valuable advice and data from remote sensing using their well-established channels in this area. There are a range of challenges and opportunities associated with the mapping of flood areas from remote sensing and Geoscience Australia hopes to see the project address these in order to improve the services available to the public and emergency services.

"[The satellite data] could give us better situational awareness by showing areas under inundation," explained Mr Sooriyakumaran.

"To forecast future water levels we need good information on what is happening on the ground now, which we can present to the emergency services so they can plan their response better."

Flood research in the Clarence Valley

Back on the Clarence River, the Clarence Valley Council Local Emergency Management Officer, Kieran McAndrew, said the river is the heart of the council area. It has been affected significantly by flooding in recent years—2009, 2011, 2012 and 2013 all saw serious floods.

"It is the largest of all NSW coastal rivers in terms of catchment area and river discharge, which means flooding is part of life for the community of around 50,000 people," Mr McAndrew said.

The Monash University-based research team, comprising Associate Professor Pauwels, Professor Jeffrey Walker, Dr Stefania Grimaldi, Dr Yuan Li and Ashley Wright, believes the research will have positive results in emergency warnings for floods and contribute to lessening the damage and potential costs to communities.

"It is estimated that in Australia floods cost an average of $377 million per year," highlighted Associate Professor Pauwels.

"An improved flood forecasting system will enhance the emergency management capability, thus reducing the flood-related financial costs and community distress."

Mr McAndrew said the council wanted to support the research in any way it could.

"The Clarence Valley community relies on warnings to prepare for imminent flooding, so there is a real benefit to be gained from the research," he said.

The next steps for the project will be to bring all the existing data together with the new satellite information and put it into operational use.

"Up until now we have focused on collecting the data. From here we will start improving the models," said Associate Professor Pauwels.

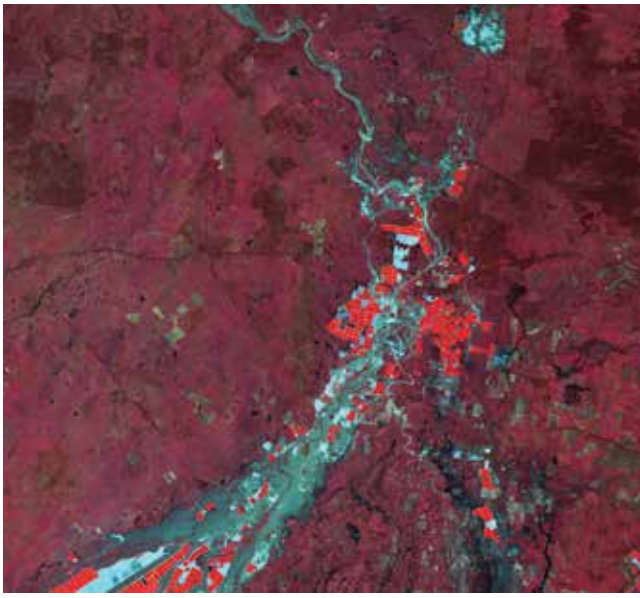
According to Mr Sooriyakumaran, this process will be made easier with the Bureau of Meteorology's recently upgraded platform for modelling, the Hydrological Forecasting System, or HyFS, which designed to allow new forecasting models, data types and approaches to be readily integrated.

However, Mr Sooriyakumaran believes that the benefits of this research will not be immediate.

"We are not expecting dramatic changes to happen overnight; they will take time," he said.

"But as technology advances and the research is applied into an operational setting, the true impact will be realised.

"The upgrade of our flood forecasting modelling system means we are able to bring research learnings into operations much more readily, a capability that we did not have before." ■



The next stage of the research will take place in St George, Queensland. The satellite image shows the Balonne River in flood on 8 February 2012. Blue to dark blue is clean water, bright blue is water with high sediment load, bright red is healthy crops and dark red to maroon shows less healthy or different vegetation types.

Find out more about this research at www.bnhcrc.com.au.

"The Clarence Valley community relies on warnings to prepare for imminent flooding, so there is a real benefit to be gained from the research."

—Kieran McAndrew, Local Emergency Management Officer, Clarence Valley Council

PHOTO: DEPARTMENT OF FIRE AND EMERGENCY SERVICES, WA

WESTERN AUSTRALIA PILOTS BUSHFIRE PREPAREDNESS TOOL

Western Australia's Department of Fire and Emergency Services is piloting a new survey tool to help householders check their bushfire preparation.

BY **BRENDA LEAHY**

Communications Officer, AFAC

Fire season after season, fire and emergency service agencies implore householders to plan and prepare for bushfire. But until now there was no proven, systematic method for agencies to monitor and report on how prepared their communities and householders were so they could achieve their goals for facing a bushfire.

In a promising development, Western Australia's Department of Fire and Emergency Services (DFES) has piloted, and given its stamp of approval to, a new easy-to-use survey tool. The tool can be used to assess a community's level of preparedness and allow householders to check how well they are prepared to meet their goals for bushfire safety.

The tool is based on a survey method initially developed by researchers for the Bushfire CRC that defined preparedness in terms of three householder goals: preparedness for safe evacuation, preparedness for safe, active property defence, and improving the fire resistance of the property.

The new Bushfire Household Preparedness Tool can deliver useful information for monitoring, evaluating and reviewing bushfire education programs. It offers meaningful data for reporting on levels of community preparedness.

In the past, agencies such as DFES have typically relied on methods such as post-fire surveys to determine whether and how well householders were prepared for bushfire. Agencies used this information, together with qualitative information captured from bushfire engagement activities, to inform bushfire education, according to Suellen Flint, DFES's Director of Community Engagement.

As the lead for the pilot project at DFES, Ms Flint said the tool provided baseline data for monitoring the effectiveness of its community-based

Bushfire Ready Groups in helping communities prepare.

"An important benefit is that it can be used to show where to address any gaps and also where, over time, we are making an impact on preparedness levels," Ms Flint said.

"This is particularly useful for reporting where we have made a positive impact, an area that has typically been difficult to measure quantitatively in the past."

Another key benefit is that the tool can be used for awareness and education.

The tool provides a self-assessment scoresheet for householders to check whether they're prepared, along with a comprehensive checklist of what's required to get ready, with visual cues and instructions.

Because of the success of the pilot, DFES has already started 'gamifying' the tool by creating a novel card-shuffle game and innovative digital version with plans to integrate the approach fully into the agency's soon-to-be-released Community Resilience Strategy. The pilot project was initially applied only for bushfire. However, it is also recommended that the tool be considered for national adoption and for all hazards. Guidelines to support its adoption as a national standard would need to be developed to support its administration and use.

The tool is based on a survey method initially developed by Dr Patrick Dunlop of the University of Western Australia with co-researcher Dr Illy McNeill (University of Melbourne) for their Bushfire CRC research project, Information Processing Under Stress: Community Reactions. Their study defined preparedness from a householder perspective in terms of their goals and provided checklists of actions to self-assess whether householders were prepared so they could achieve these goals. The findings were published in the *International Journal of Wildland Fire*.

Dr McNeill is continuing this work for an all-hazards context through her research for the Bushfire and Natural Hazards CRC. She aims to identify important barriers and enablers to motivating preparedness and planning by residents in order to improve the effectiveness of agency–community engagement strategies.

DFES conducted the pilot to test the tool and its potential applications within agencies as a research utilisation initiative though AFAC.

The original survey developed by the researchers had been presented to AFAC's Community Safety Group for consideration for agency use and possible national adoption. At the time, as AFAC's Director of Information and Community Safety, Amanda Leck, explained, the group recommended that the survey methodology, including factors such as language and potential fit for agency applications, be reviewed.

"The Community Safety Group then referred the initiative to the Community Engagement Technical Group to test and refine the survey and investigate potential opportunities for its use nationally," she said. The pilot study was recommended, with the findings set to be reported back to these AFAC groups this year.

DFES was keen to participate in the pilot as part of its agency-wide focus on innovation. This strategy encourages best practice through learning, knowledge management, continuous review and evidence-based practice across all operational areas.

To start the ball rolling, Ms Flint engaged a WA-based Community Engagement Consultant, Viv Warren, for the tool's development. Ms Warren pre-tested the original survey tool, including its language and accessibility, to make it more practical for DFES or potential broader agency purposes. She then worked closely with Dr Dunlop to adapt and simplify the tool for everyday use to ensure its scientific integrity remained intact.

DFES piloted the revised tool in late 2015, assessing levels of preparedness in three types of communities: those just starting out with a community-based Bushfire Ready Group (less than 12 months), those with a mature Bushfire Ready Group (two–five years) and a control group with no Bushfire Ready Group in place.

The self-assessment surveys were distributed at local events and 91 people completed them. The approach allowed community engagement officers to be available for questions and assistance.

Among its key findings the survey showed DFES that:

- communities with no Bushfire Ready Group were less committed to actively defending their homes than those in new or well-established groups
- all surveyed communities indicated they had adequate insurance cover
- contentment on preparedness actions can set in after time in well-established Bushfire Ready Groups.

"While there were no real surprises from the pilot survey results, we did take note that contentment can set in within established Bushfire Ready Groups and we will work on this as we move forward," said Ms Flint.

"Overall, the results also suggest that there is generally a good level of awareness around what needs to be done to be prepared in all groups, but there is still some room for improvement."

Now that the 2015–2016 fire season has ended, DFES will conduct debrief discussion forums in the surveyed communities, except the control group, to reflect on the results and discuss strategies for sustaining good practice and improving preparedness.

A key part of the roll-out will be training Bushfire Ready Group facilitators in the method. ■

PHOTO: DEPARTMENT OF FIRE AND EMERGENCY SERVICES, WA

For copies of the report, contact:
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A bushfire preparedness tool is helping communities meet their goals for bushfire safety.

ENVIRONMENTAL SELECTION AND USE OF FIREFIGHTING FOAMS

FIRE SAFETY PERSPECTIVE

The fire protection industry has concerns with the Queensland Department of Environment and Heritage Protection's draft policy on firefighting foams, and calls for modifications.

ACRONYMS USED THROUGHOUT THIS ARTICLE

- C8—foam containing fluorinated surfactants with carbon chains where C ≥ 8
- C6—foam containing fluorinated surfactants with short carbon chains where C ≤ 6 (in accordance with US EPA Stewardship Program)
- F3—fluorine-free foam

BY **BRETT STAINES**

Technical Development Manager, Fire & Security Products, Australasia, UTC

Firefighting foam is a suppression agent used for controlling and extinguishing fires involving flammable liquids. Recently there has been an increased focus on environmental effects from using firefighting foam, often without due consideration for other important issues such as firefighting performance, firefighter safety and system compatibility.

The Queensland Department of Environment and Heritage Protection (DEHP) has released a draft policy on the use of firefighting foams. While its intention to improve environmental outcomes is to be praised, the policy has several serious shortcomings that not only undermine the aim of reducing environmental effects but would also have adverse effects on safety for firefighters, personnel in hazardous industries and the community in general.

It's hoped that by way of this article the concerns the fire protection industry has with the draft policy will be more widely appreciated and will lead to the draft policy being modified so that improvements to both environmental and fire safety outcomes can be achieved.

Points of agreement

FPA Australia agrees with several parts of the DEHP draft policy:

- All firefighting foams have adverse environmental impacts.
- Foam containing the surfactant PFOS should be banned and existing stocks removed from service and destroyed.
- All foam and fire water effluent should be managed in an environmentally responsible manner.
- End users should transition from fluorinated foams containing perfluorooctanoate (PFOA) and carbon chain length $C \geq 8$ (over a suitable transition period).
  FPA Australia notes that existing fluorinated foams containing PFOA are being reformulated to eliminate PFOA and these will soon become available.

FPA Australia's concerns

While some common ground exists, FPA Australia has serious concerns with parts of the DEHP approach. In particular, FPA Australia believes that promoting selection decisions based only on the environmental properties of firefighting foam concentrate is a flawed approach. Firefighting performance is equally important in determining the environmental outcomes for an incident (e.g. duration, toxic combustion products and volume of fire water effluent produced), as well as business continuity and safety of firefighters, hazardous facilities and the community in general.

Choosing the best firefighting foam for an application must, first and foremost, be based on selecting the best product to protect people, property and the environment. This requires selection based on a balance

of firefighting performance, reliability and life safety, with minimal toxicological and environmental effects. As a general guide the Association recommends the following criteria be used for firefighting foam selection:

- firefighting performance
- life safety
- physical properties and suitability for use on known hazards
- compatibility with system design and approvals
- environmental considerations.

Although environmental performance is important, failure to adequately consider the firefighting and system performance aspects may result in selection of a foam that is ineffective for extinguishing fires. This can lead to greater environmental impact resulting in longer extinguishment times, use of larger quantities of foam and water and the production of significantly greater quantities of fire water effluent, which requires disposal.

Firefighting foam is part of a system

Evidence of suitability (certification) must be provided to demonstrate any foam's ability to achieve the required firefighting performance for the fuel in question, following appropriate and recognised testing. Evidence of suitability must also be used to demonstrate that the foam is compatible with associated systems and equipment. It is not always possible to change the type of foam used in a system without having to make significant modifications to the system. For example, many foams have high viscosity and may not be able to be correctly proportioned using existing hardware in systems where low-viscosity foams were previously used.

Any proposal to change the type of foam used in a system requires careful consideration and must take fire safety and engineering factors into account. The type of foam used should not be changed without completing a detailed review of the design, performance and operation of the system as a whole. Such design reviews should include consultation with fire system designers, foam and foam hardware suppliers and the relevant authority.

FIGURE 1 Summary of foam consumption at Caltex's Banksmeadow incident—July 2013.

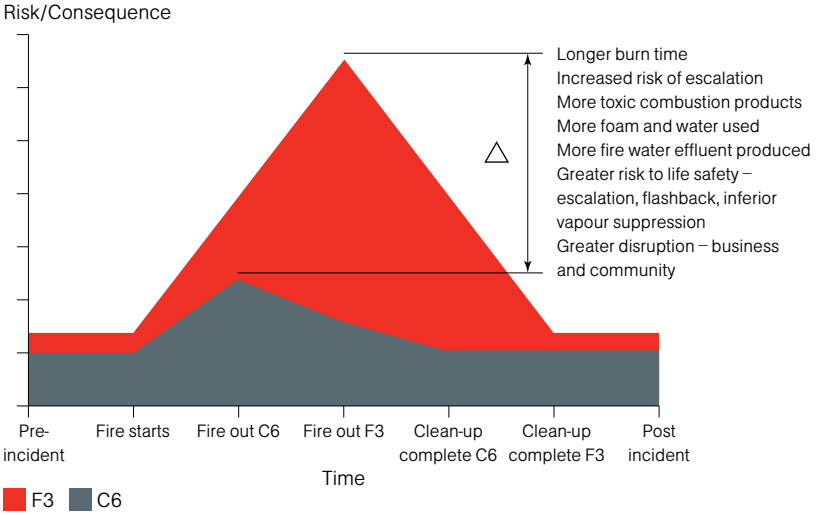
SOURCE: PFA AUSTRALIA

NFPA11 Table 5.7.3.2 would indicate a minimum design requirement of 6.5LPM/m^2 for 20mins for the bund fire event. This equates to ~7200 litres of foam concentrate. This was not in place. Historical design case was largest tank top fire and minor bund spill. Profile of foam consumption is shown here.

Period	Timeframe	Foam type	Foam consumed
Up until isolation	01.50 – 02.50 am	AR-AFFF in 200L foam drums plus small quantity recovered from fixed systems	1,000 litres (1hr)
Following isolation	02.50 am – Fri 10.00 am	Solberg R6 from Aviation Rescue and Fire Services	1,750 litres (7hrs) Application required every 15–20mins
Maintenance of foam blanket	Fri 10.00 am – Sat 04.00 am	3% FP70 Plus Tankmaster	4,000 litres (18hrs) Application required every 90mins

FIGURE 2 Using foam with inferior firefighting performance can result in increased risk/consequences

SOURCE: PFA AUSTRALIA



Using foam with inferior firefighting performance can mean increased risk and consequences

No such thing as environmentally friendly foam

Let's be clear—there is no such thing as environmentally friendly foam. All firefighting foams have adverse effects on the environment. However, it must also be recognised that fires—especially those involving flammable liquids and other chemicals—also have significant adverse environmental effects in their own right. It is a general objective to extinguish a fire as quickly as possible. In achieving this objective there is a positive effect in terms of minimising risk to life safety, property, the environment and business interruption. Specifically, using the minimum possible quantity of foam and water to control or extinguish the fire is greatly beneficial because it reduces the environmental impact by reducing the amount of fire water effluent to be managed post incident. Good firefighting performance is critical to good environmental outcomes. Therefore, firefighting performance cannot be ignored when making selection decisions aimed at minimising environmental impact. Poor firefighting performance is worse for the environment because of:

- longer extinguishment times—risk of escalation, more toxic combustion products, risk to life, property and business continuity
- use of larger quantities of foam and water—more toxic and contaminated effluent
- life safety concerns—e.g. slow knockdown, poor flashback resistance, unreliable post-fire securement and risk of escalation.

Not all foams are equal

Firefighting foams have different firefighting performance. Effective firefighting foams must:

- be compatible with the foam proportioning and delivery equipment
- cool the fuel surface
- protect from re-ignition
- resist attack or breakdown by the fuels (in particular, polar solvents)
- resist mixing with the fuel
- spread rapidly over the fuel surface

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Significantly, firefighting foams containing fluorinated surfactants have valuable firefighting performance characteristics that historically have been unmatched by F3. These performance advantages, which include improved firefighter safety and increased firefighting effectiveness (vapour suppression, knockdown and burnback), can significantly reduce the amount of foam required to control an incident and limit damage to the environment and risk to life and property. That said, some F3 foams have recently achieved compliance with Australian Standards for use in portable fire extinguishers and pre-engineered systems, and development continues to improve F3 performance.

Less post-fire effluent

Better firefighting performance means less post-fire effluent. These performance differences are not limited to small-scale fire tests. An incident at Caltex's Banksmeadow terminal in Sydney in July 2013 provides a real-world example of the significant performance difference between F3 and fluorinated foams. Foam was used for vapour suppression and to prevent ignition of a large 175,000-litre fuel spill. When using fluorine-free foam (F3), effective vapour suppression (maintaining vapour levels below the fuel's lower explosive limit) was only achieved for 15–20 minutes before foam needed to be re-applied. However, when fluoroprotein foam was later used, vapour suppression was achieved for 90 minutes.

This example demonstrates that use of fluorinated foam provided significantly longer protection and reduced frequency of re-application at that time. It also serves to demonstrate that using a foam with superior firefighting performance can significantly reduce the amount of foam and fire water effluent that needs to be managed post incident.

No silver bullet

Fluorine-free foams do not provide a 'silver bullet' solution to environmental problems associated with the use of firefighting foam. As demonstrated above, using F3 in some fire incidents could require significantly larger quantities—three or more times the amount—of both foam and water to manage an incident because the firefighting performance is inferior to fluorinated foams.

Increased risk

Poor firefighting performance equals increased risk. The draft policy incorrectly implies that the total risk resulting from an incident, up to the point the incident is controlled, will be the same regardless of the type of firefighting foam used. That is, the draft policy assumes that the firefighting performance of all foams at a given incident will be equal. As illustrated in Figure 2, this is not the case.

Hazardous facility managers need the flexibility to use risk management principles to select the most appropriate foam to manage the particular risks. The risk management for these facilities must be considered holistically, from pre to post incident, and not be based solely on the environmental properties of the foam concentrate.

Contamination and using F3

Using F3 doesn't eliminate existing contamination. The Queensland DEHP draft policy incorrectly assumes that if F3 has been used at an incident there will be no contamination with fluorinated compounds in the fire water effluent. Changing to F3 does not eliminate long-chain fluorinated compound contamination in facilities that have previously used fluorinated compounds. Long-chain fluorinated compounds can be present many years after changing to F3. The experience at AirServices Australia sites demonstrates this situation.

AirServices Australia sites changed to F3 five years ago; however, soil and groundwater at these sites is still contaminated by PFOS. As a result, FPA Australia believes all fire water effluent should be considered to be contaminated and that it be contained and tested before determining the appropriate method of treatment and disposal, regardless of the type of foam used.

Proper management of fire water effluent is important to minimise adverse environmental effects. FPA Australia believes environmental policies should focus on stipulating how the fire water effluent from an incident should be managed irrespective of the type of firefighting foam used. The mantra for the management of all fire water effluent should be—*contain, test, treat.*

Risk must be managed holistically

The environmental risks resulting from fires in hazardous facilities must be managed holistically. Environmental regulators must acknowledge that different foam technologies have different firefighting performance characteristics and these can significantly affect the environmental outcome of an incident.

FPA Australia believes that foam users must be allowed to select the foam to best manage their risk and endorses the approach to selection and use adopted by the UK Environmental Protection Agency. It allows emergency services and hazardous facility managers to select and use the most appropriate foam concentrate to to best manage their risk (putting out the fire as quickly and efficiently as possible—fewer combustion products, increased safety, less foam and water usage and less effluent to manage afterwards).

We recommend that Australian regulators adopt a similar approach. FPA Australia believes broad industry consultation is required to address the concerns of this draft policy. Regulators must engage in open, meaningful and transparent discussion to ensure any proposed policy and its effects are fully considered and are compatible with life safety objectives in the first instance. Regulators must not base post-fire effluent treatment decisions purely on the type of foam concentrate used. All fire water effluent must be treated as contaminated with long-chain fluoro chemicals regardless of the type of foam used (unless on-site testing proves otherwise).

The draft policy's proposed restrictions on the use of C6 fluorotelomers are unnecessary. The restrictions would effectively prohibit their use despite these new-generation fluorinated foams, produced in accordance with the US EPA Stewardship Program. C6 foams are a legitimate and environmentally acceptable option alongside fluorine-free foam and should therefore attract similar conditions for use to those prescribed for fluorine-free foams. There is no precedent either within Australia or in any other country for such onerous restrictions on the use of C6 fluorotelomers.

Finally, industry must be allowed sufficient time to transition from existing foam stocks of C8 (non-PFOS) to either US EPA-approved C6 formulations or F3 as appropriate to the particular facility or application. ■

FPA Australia has published an information bulletin covering in detail issues affecting the selection and use of firefighting foam, available by following the links from www.fpaa.com.au/technical.

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THE SOCIAL LIFE OF SCIENCE IN POLICY AND PLANNING

Case studies by the Bushfire and Natural Hazards CRC highlight paths to integrating bushfire science in government policy and practice.

BY **DR TIMOTHY NEALE**

Researcher, Bushfire and Natural Hazards CRC and Western Sydney University

Quite rightly, people in the natural hazards sector hold science in high regard. Scientific research is crucial to predicting and preparing for events where behaviors are unpredictable and where consequences are high. As such, it is unsurprising that government agencies often emphasise their commitment to having 'science-led' policies. But the routes between science, policy and planning are complex and variable. What is clear is that there is no simple relationship between having 'more' science and 'less' uncertainty, or that more or less of either leads to action (the relationship between scientific research and climate change policy is a prime example of this). I could list dozens of reasons why the interface between science, policy and practice does not run smoothly, but let us focus briefly on two.

PHOTO: TIMOTHY NEALE

Research has examined different burning scenarios around the Otway Ranges in Victoria to assess future bushfire risk.

First, science is a diverse world of knowledge and as such, it is ripe for debate, whether by scientists, politicians, policy-makers or others. The fact that the research process is open-ended, in which uncertainties can often be reduced but not resolved, means there are often abundant reasons to delay decisions about how to proceed.

Second, there are many obstacles to integrating science within government agencies, not the least of which is resource constraints. Other factors of institutional culture also influence how, and if, new research is utilised.

None of this is anyone's fault—they are simply the conditions in which we operate. In the Scientific Diversity, Scientific Uncertainty and Risk Mitigation Policy and Planning project at the Bushfire and Natural Hazards CRC, the research team is looking at three case studies where scientific knowledge is changing how natural hazard risk is mitigated. The driving questions of the project are about the science, policy and practice interface.

Given that uncertainty is an inherent part of scientific practice and method, for example, how do those engaged in risk mitigation manage these uncertainties in their decision-making?

PHOTO: NATHAN MADDOCK, BUSHFIRE AND NATURAL HAZARDS CRC

Gamba grass burns hotter and faster than native grasses and is increasing fuel loads around Darwin. There is a big focus on mitigating the risk, but fires fuelled by gamba are beginning to claim houses and other assets.

What do practitioners think are the keys to bringing new scientific knowledge in? What else is in play beyond the given technical innovation? We have been very fortunate to find some great partners in the sector interested in understanding more about this space. Our aim is that this project will support the capacity of practitioners to explain and justify what they do to others, whether those others are other risk mitigation professionals, the public, the media, or courts and inquiry processes.

In each case study we begin by interviewing practitioners in the area to understand from them how science and other forms of knowledge inform their work and what they feel are the key issues and uncertainties that they face. We then hold a workshop to discuss these factors using scenario exercises where practitioners are given different scenarios, or predictions, of what the area they work in might be like in 20 years' time.

Understandably, people who work in the natural hazards sector are often focused on the immediate context: what is going to happen this season? What is happening in the community this year? A scenario exercise is a good way to move outside these parameters to think, in this case, about longer trends, how we are going to prepare for these futures and how science can and should inform these preparations.

So far, we have held workshops for two case studies, one in the Barwon–Otway area of south-west Victoria and one in the Greater Darwin area of the Northern Territory.

Victorian case study

To tell you a little about these case studies, let me start in Victoria. For the past several years, the Barwon–Otway area has been the site of a pilot, led by the Department of Environment, Land, Water and Planning, to test an alternative strategy to mitigate bushfire risk. To simplify, the risk-based strategy involves, first, generating loss estimates from suites of bushfires simulated within PHOENIX RapidFire (a 2D bushfire simulator) and, second, comparing asset losses between those suites. This might involve, for example, simulating fires under worst case (i.e. Black Saturday) weather conditions, in which:

1. no planned or unplanned fires have occurred for several decades,
2. all public land has been prescribed burnt, and
3. some accidental fires and some prescribed burning have occurred.

Given the model's ability to predict house losses from the intensity of each fire, the three suites can therefore be compared to reveal the benefit of fire in the landscape and the residual risk that remains.

A more complex arrangement, also trialled, compares multiple asset losses across multiple suites, each comprising thousands of simulations using random ignition and weather scenarios. In short, it is a system for calculating bushfire risk and measuring the benefits (or not) of intervening in the landscape.

Of course, some things fit into modelling better than others. One of the primary drivers of risk management anywhere is reducing losses of human life. But human behaviour—particularly human behaviour in rare and extreme events—does not map well onto algorithms. The practitioners we have met have often stressed the importance of pairing advanced tools such as PHOENIX with professional experience, local knowledge and interpersonal trust.

The Victorian Government has recently announced that it would be moving to this risk-based strategy (also known as Bushfire Risk Landscapes) across the state in mid-2016. This is a "brave and positive step," to quote Dr Trent Penman, a bushfire behaviour expert and colleague in the CRC from the University of Melbourne. It moves away from the existing focus on burning a percentage (5%) of public lands each year to reduce the risk to life, property and the environment. The hope of the research team is that our work with fire, land and emergency managers in the Barwon–Otway area will provide some

One of the primary drivers of risk management anywhere is reducing losses of human life. But human behaviour—particularly human behaviour in rare and extreme events—does not map well onto algorithms.

insight into one of the key steps in this policy transformation and the new questions it has raised for practitioners.

Once agencies have a new level of information about where risk lies in the landscape, and the benefit and potential of mitigation, what is the best strategy for passing that information on to the wider public? While, as Eburn and Handmer argue (2012, p. 19), there "is no legal impediment to releasing reasonably accurate hazard information," there are clear disincentives to freely releasing information that is highly complex and has the potential to be reused in negative ways.

Northern Territory case study

The Northern Territory is quite a different case from 'down south', as Territorians often point out, although it also presents interesting parallels in natural hazard management. As part of the tropical savannah, the Greater Darwin area has an annual bushfire season in which approximately 40% of the total area is typically burnt. Every year, as the wet season subsides around April, bushfire practitioners burn off the new grass with the aim of reducing fuel loads during the late dry season.

Unlike 'down south,' this abundance of fire in the landscape is widely accepted as part of Territory life and its environment. However, several trends in the Greater Darwin area are now changing the bushfire risk and its mitigation.

One primary driver in this situation is gamba grass, a pasture species introduced in the 1970s and 1980s that grows into tall, thick and flammable plants if not grazed intensively. Gamba grass is very invasive and has, over the past decade, turned parts of the Greater Darwin area to monoculture, creating high fuel loads that, in the right conditions, produce up to eight times more heat that native grassfires.

Another driver of change is the increased level of subdivision and housing development surrounding Darwin, as areas such as Palmerston and Litchfield take up some of the city's population pressure. Bushfires, previously understood as a minor risk in the Northern Territory, are beginning to claim houses and other assets in the areas infested with gamba grass.

Our work with practitioners has given us a new understanding of how crucial science and practitioners have been to understanding this risk and responding to it through policy and planning. For example, demonstrating the characteristics of gamba grass, tracking its progress, and illustrating its economic and environmental costs have all been necessary in attracting the attention of policy-makers and the public in the Northern Territory, a place in which budgets are routinely strained and fire management is not—for various reasons—a top government priority.

Next case study

In 2016, the team is moving onto a third and final case study, hoping to draw links between the different contexts we have engaged with. What is clear is that scientific research, whether in a laboratory or a landscape, is never simply technical.

Neither is there a single stable entity we might call 'science'; it is instead, as van Kerkhoff and Lebel state (2006, p. 454), "permeable, changeable and contestable". As such, the ways in which decision-makers and practitioners integrate and use science is a thoroughly social question, shaped by the capacities and affordances of the contexts in which they operate. While it is important to continue to place a high value on scientific research in the natural hazards sector, it is also important to remember that this research is embedded in social dynamics and social networks—a 'social life' which we are, at present, only beginning to understand. ■

Find out more about this research at www.bnhcrc.com.au.

PHOENIX RapidFire was developed through a collaboration between researchers from the Bushfire CRC and the University of Melbourne.

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Gamba grass-infested country near Batchelor, Northern Territory, August 2015

PHOTO: TIMOTHY NEALE

TPS CABLES
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FireSense CABLES

TPS CABLES

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2 CORE FLAT WHITE STRIPE

2 CORE TWISTED

2 CORE TWISTED/SCREENED

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FR STAINLESS STEEL TIES

AS/NZS 3013 Approved - ActivFire listed

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2 CORE

4 CORE

6 CORE

2 CORE SCREENED

4 CORE SCREENED

10 CORE

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USING RESEARCH?

LEARNING FROM EXPERIENCE

What works and what gets in the way of using research? End users and CRC researchers share some firsthand insights in the latest AFAC case study on research utilisation.

PHOTO: DR YOKO AKAMA, RMIT

Community-centred innovation.

BY **BRENDA LEAHY**

Communications Officer, AFAC

This edited extract of an AFAC case study details how a tool to channel social networks for resilience building made its way from research to practice in diverse, hazard-prone communities across Australia.

End users and researchers reveal some practical tips and firsthand insights about what was needed for successful research utilisation and the different ways that research influences thinking and drives change in practice.

The full case study can be downloaded at the AFAC website at www.afac.com.au/initiative/research.

Case study: Taking charge of risk—networking towards resilience

Why are people in some fire-prone communities more prepared for bushfire threat than others?

According to research, it may be determined by 'who you know' as much as 'what you know'.

RMIT University researchers for the Bushfire CRC set out to understand social networks—the formal and informal ways that people connect, relate, organise, influence, communicate and share resources—and how they can potentially be channelled for scalable and sustainable preparedness and resilience-building initiatives.

Overall, the research confirmed that people rely heavily on trusted relationships in their networks for information. The research recommended that emergency management organisations, in particular fire and land management agencies, promote the importance of being linked into a local 'network'. Agencies could also play a key role in encouraging, linking and supporting these vital networks.

The main idea is that well-connected or socially networked individuals and their communities are well positioned to take charge of their safety and buffer the impact when disaster strikes. These local networks hold the key to identifying and targeting information and resources and to using the power of positive peer-to-peer influence to identify and manage their share of the risk, and their valued social, economic and ecological assets.

Among its key findings, the Bushfire CRC study concluded that a householder might have a well-prepared property and a fire plan, but could still be at risk if they were disconnected from local social networks.

These networks, which can operate formally, informally and spontaneously, serve a range of crucial functions for preparedness and recovery, including channelling critical information and the targeting and sharing of resources before, during and after disasters.

Building on case studies and interviews conducted in Tasmania in 2012, and earlier studies in Victoria, the research team, led by Dr Yoko Akama, a communication design specialist at RMIT, delivered an innovative social network analysis approach. The approach was purpose-designed for application in bushfire management but is relevant to all hazards.

The evidence-based approach provides the theory and practical tools, frameworks and skillsets to identify, understand and map social networks, address gaps and vulnerability, create links and start conversations about what can be done to prepare for and recover from disasters.

Emergency service organisations including fire and land management agencies, non-government organisations and councils in hazard-prone communities across Australia have used the approach, which was initially embedded within the Advanced Diploma of Public Safety offered by the former Australian Emergency Management Institute.

About 400 practitioners from across the sector have undertaken the course. Numerous participants have adopted the social network analysis approach to design and deliver engagement and

Science in action: moving knowledge into practice

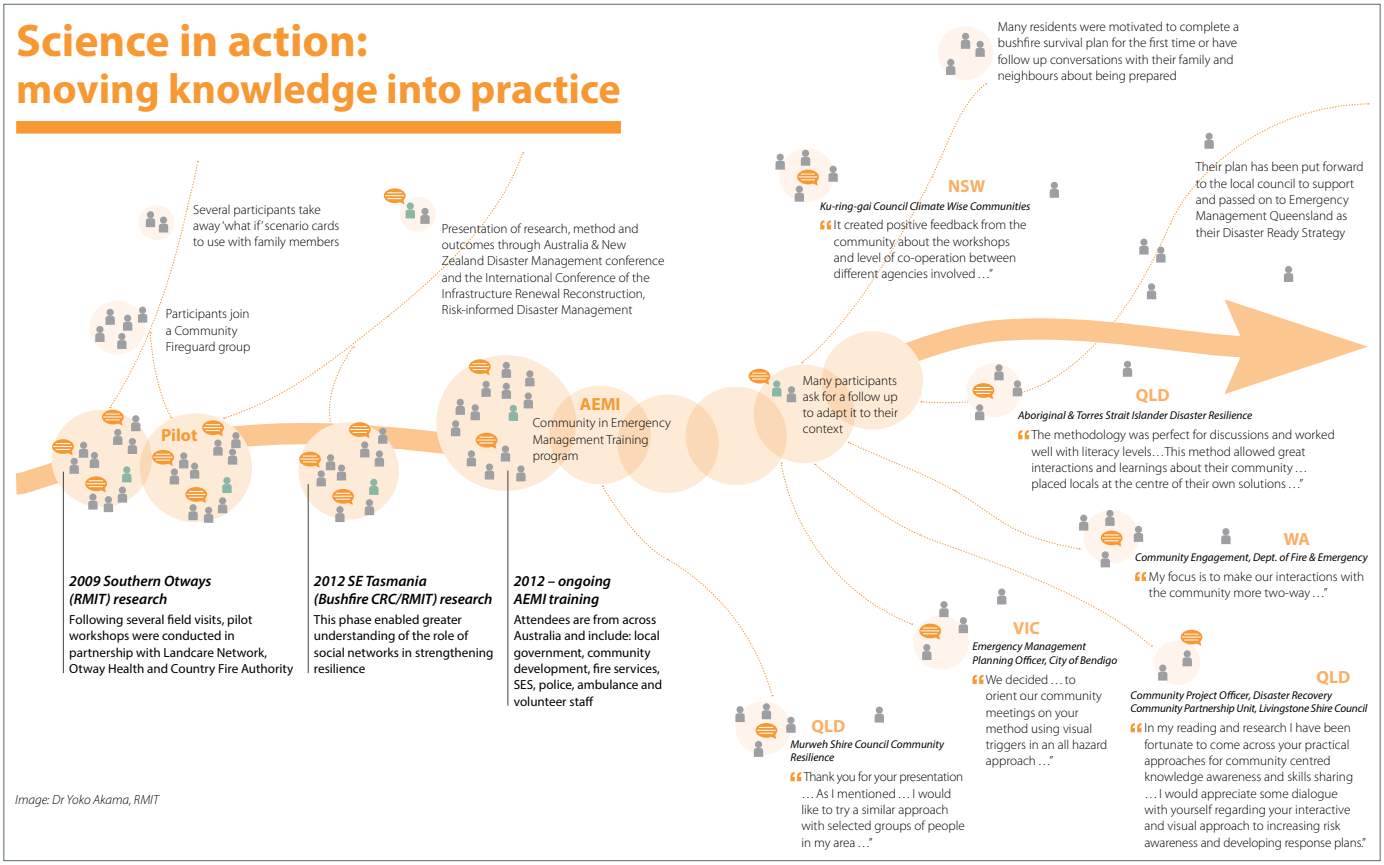


Image: Dr Yoko Akama, RMIT

PHOTO: DR YOKO AKAMA, RMIT

Facilitating a workshop in flood-prone Queensland community, Chebourg.

education programs tailored to the unique demands of their communities.

According to Dr Akama, professional development is critical to helping prospective users understand and make sense of theory and potential applications for their practice.

Researchers also need to understand the perspectives of their end users, she said.

"Applied research generally only makes sense when it addresses the concerns, questions and needs of the end users. Therefore, you need them to contribute to the process. My research alone wouldn't have changed anything."

Practical and visual tools and resources are also recommended to support learning and knowledge transfer. ■

This case study is part of a series co-developed by AFAC and its member agencies and partners with the aim to share examples of evidence-based practice and principles to support and promote research utilisation capability. For further information on the research, contact Dr Yoko Akama on yoko.akama@rmit.edu.au. For further information on research utilisation contact noreen.krusel@afac.com.au

IMPORTANT TAKE-OUTS FOR RESEARCHERS AND END USERS:

- Communicate your work far and wide to engage and actively involve end users.
- Inform your research plan and approach from end user insights and feedback.
- Develop practical, accessible and visual tools and resources that engage end users.
- Help end users adapt the research outcomes for their practices.
- Provide hands-on learning and development.

The evidence-based approach provides the theory and practical tools, frameworks and skillsets to identify, understand and map social networks.

PORTABLE FIRE EXTINGUISHERS

Q&A PART 1

BY **BARRY LEE OAM**

It has often been pointed out that almost all fires are small at origin and could easily be extinguished if the proper type and appropriate amount of extinguishing agent were readily available and promptly applied. Portable fire extinguishers are designed to fulfil this need. True enough in theory—but many questions arise in day-to-day practice. Part one of this article provides some typical questions and answers about portable fire extinguishers.

Can we charge dry chemical extinguishers with compressed air?

Yes. However, two factors need to be borne in mind. First and most important, the gas used for pressurising dry chemical extinguishers must be moisture-free. This is readily achieved by purchasing dry nitrogen, but is rather more difficult to guarantee when using compressed air.

Second, it is convenient to use dry nitrogen from high-pressure storage cylinders (via appropriately set and locked pressure regulators) but many industrial air compressors cannot develop the pressure required. Compressed air is rarely used for gas container type dry chemical extinguishers because of industrial compressor pressure limitations and the larger gas containers required.

Nevertheless, given acceptable dryness, dry chemical extinguishers pressurised with either nitrogen or compressed air will perform similarly.

Are there any differences in fire extinguishing capability between gas container (cartridge) operated and stored pressure dry chemical extinguishers?

In the strictly practical sense, no. Cartridge operated and stored pressure extinguishers of identical capacity, discharge time and range of stream will show similar fire extinguishing capabilities.

Would traces of AB(E) dry chemical seriously contaminate, say, commercial biscuit production?

The answer depends, of course, on what is meant by 'traces'. If an AB(E) dry chemical extinguisher were to be discharged near a biscuit production plant and the odd particle were to settle on product in process, then that could scarcely be considered cause for concern. Monoammonium phosphate is an acidic salt—if detectable quantities of this agent were to contaminate product in process then the product would need to be discarded.

Will AB(E) dry chemical adversely affect magnesium or titanium alloy aircraft parts?

AB(E) dry chemical is not suitable for use on magnesium fires. It may be used on tyre, hydraulic fluid and similar fires without fear of damage to magnesium or other alloy landing gear components. AB(E) dry chemical, being acidic, should be removed from metal components and structures immediately after fire extinguishment.

Would the addition of a corrosion inhibitor affect the electrical conductivity of a stored pressure water extinguisher?

Among other factors, the purity of water determines its electrical conductivity (specific resistivity). Therefore, distilled water is the safest and added salts or other impurities will generally increase conductivity (decrease resistivity).

Theoretically then, the addition of corrosion inhibitors will generally result in greater conductivity. Of course, water extinguishers are not normally recommended for use on or around energised electrical equipment because too many possible risks may be involved.

Apart from the conductivity of the water, the character of discharge (spray vs jet), flashover distance and the risk of developing conductive puddles, etc., must be taken into account.

Would finely divided water spray from a fire extinguisher constitute a shock hazard if discharged on energised domestic electrical appliances?

Probably not. However, because several things are uncertain (including degree of fineness of water spray, distance from energised apparatus, possibility of formation of conductive puddles and condition of operator), ordinary water extinguishers, whether capable of spray discharge or not, are not normally classified or recommended for this duty.

What causes possible operator electrical discomfort in an improperly designed carbon

Cartridge-operated extinguisher

Nineteenth century fire extinguisher grenades.

A stored pressure dry chemical extinguisher in action.

dioxide extinguisher?

Since dry ice particles are invariably present in carbon dioxide extinguisher discharges, all such extinguishers present the potential for operator electrical shock discomfort. The operator hazard arises not so much from the shock discomfort as from the resulting involuntary reaction causing lost footing, falls from ladders and the like.

In some extinguishers the shock hazard is minimised by the use of static eliminator wires in intimate contact with the discharge horn, conductive hose and electrically bonded horn, hose and valve assemblies. Through such an arrangement, electrostatic charges are continuously relaxed through the operator to earth.

What is the maximum ambient temperature to locate a carbon dioxide extinguisher?

Carbon dioxide extinguishers are designed and tested for operation over a temperature range of −40°C to +49°C unless otherwise rated. The bursting disc will rupture at a pressure corresponding to approximately 65°C.

What is a TMB extinguisher?

TMB is an acronym for trimethoxyboroxine. This agent, as used in fire extinguishers, contains excess methanol to render it free-flowing and, for shipping purposes, is classified as a flammable liquid.

When applied to combustible metal fires (primarily magnesium fires) from specially adapted 9 L stored pressure extinguishers, TMB yields a heat flash caused by breakdown of the compound and ignition of the methanol. The white metal fire is rapidly extinguished and a secondary greenish flame of short duration occurs.

A molten boric oxide coating on the hot metal excludes air. Production has been largely discontinued as a result of both small offtake and the special skills required in application.

Could you provide a rough timeline applicable to portable fire extinguisher development?

According to the National Fire Protection Association, USA:

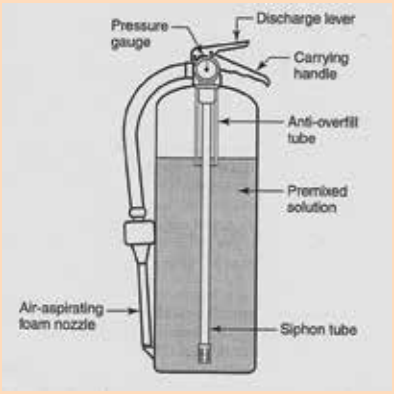
> The first real portable fire extinguishers were developed in the late 1800s. They were soda-acid (although the capabilities of sodium bicarbonate dry chemical were known then too), originally constructed with glass bottles of acid which, when broken, dumped the acid into cylinders containing the alkaline solution. The resulting chemical action produced sufficient gas pressure to expel the solution.

So, extinguishers as we know them date back about two centuries. ■

The first real portable fire extinguishers were developed in the late 1800s. They were soda-acid (although the capabilities of sodium bicarbonate dry chemical were known then too), originally constructed with glass bottles of acid which, when broken, dumped the acid into cylinders containing the alkaline solution. The resulting chemical action produced sufficient gas pressure to expel the solution.

DEVELOPMENT OF PORTABLE EXTINGUISHERS IN THE USA

(Dates are approximate.)



Sectional view: stored pressure foam extinguisher.

1908
Carbon tetrachloride extinguishers introduced

1917
Chemical foam extinguishers developed (alkaline salt–acidic salt solutions)

WW1
Carbon dioxide extinguishers introduced on a limited basis (these became a very big item during WW2, and are thought to have made their industrial debut ca 1933)

late **1920s**
Cartridge-operated water extinguishers introduced; they originally contained a calcium chloride solution and could therefore be installed in unheated areas

1928
A non-freeze alkali-metal salt solution called 'loaded stream' developed for use in cartridge-operated extinguishers; these may be regarded as precursors to the current wet chemical extinguishers for Class F fires

An effective cartridge-operated dry chemical extinguisher marketed in the USA

1950s
Stored pressure dry chemical extinguishers introduced

1954
Halon 1301 extinguishers introduced

1959
Stored pressure water extinguishers developed (in the USA at least; earlier pumped-up variants were in service in Scandinavia and elsewhere)

1961
'Tri-class ABC' or 'multipurpose' dry chemical portables arrived on the scene

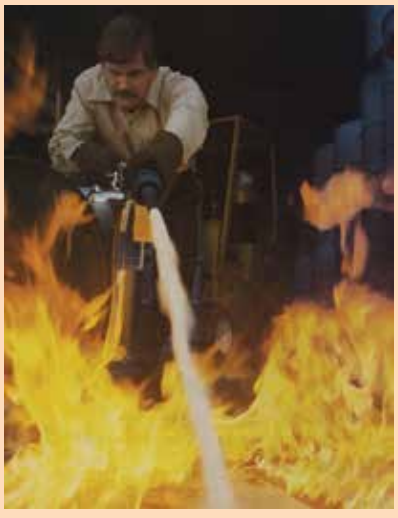
1973
Halon 1211 extinguishers introduced to the US market (earlier in Europe)


Dry Powder, Carbon Dioxide and Vaporizing Liquid Extinguishers

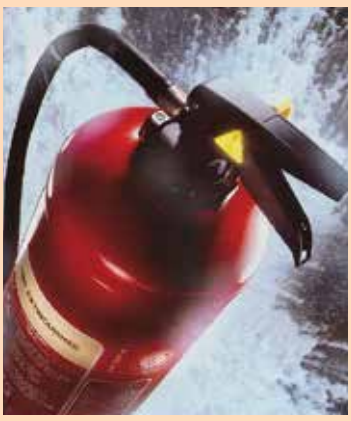
On fires involving either liquids in containers or spilled liquids, direct the jet or discharge horn towards the near edge of the fire and with a rapid sweeping motion drive the fire towards the far edge until all the flames are extinguished.

On fires in falling liquids, direct the jet or horn at the base of the flames and sweep upwards.

Recommended operating technique.



Stored pressure AFFF exitinguisher in action.



Stored pressure foam extinguisher.

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An elevator gantry crashed through the roof, pictured here above tonnes of raw, burnt sugar.

Aerial view of the destroyed terminal.

TOWNSVILLE BULK SUGAR TERMINAL FIRE – 1963

BY **BARRY LEE OAM**

Construction of the Townsville Bulk Sugar Terminal was completed in 1959. It was approximately 305 metres long, 46 metres wide and stored sugar up to 21 metres high at its centre. Concrete apron walls five metres high contained the sugar at its normal angle of repose. The terminal was destroyed by fire in May 1963, belying the widely held belief that raw sugar would not burn.

The fire started in a stack of 77,000 tonnes of raw sugar, apparently caused by overhead welding. When it was finally extinguished, after three-and-a-half days of continuous effort, about 45,000 tonnes of sugar had either been burnt or washed away. Another 35,000 tonnes was heavily contaminated by charred ash, salt water, magma or debris and more than one-half of the steel building frame was destroyed.

The facility sustained £6 million of damage (Australia still used pounds as currency), thought to be the largest insurance payout in Australia at the time. More than 50 years later locals recall the intensity, damage and the stench of what was Queensland's biggest structural fire. The clean-up was immense: magma, some 0.6 ha of it more than 0.6 m thick, had to be removed from the floor. Magma at each hopper had to be emptied into the tunnel under the shed and washed out. Finally, the tangled mass of steel had to be removed and disposed of.

It was the first time in Queensland's history that firefighting services from other regions were called on—only to then find that some of their equipment and systems were not compatible.

The terminal was rebuilt in 1963 and a second bulk sugar shed was added in 1965. Automatic sprinklers and smoke alarms were installed. Fire service training and equipment was subsequently standardised throughout Queensland.

Reportedly, the 'pol' (polarisation, or purity) of the sugar stored at the Townsville terminal was only 97.5, appreciably lower than the usual value of 98.5. This was the first time that sugar of lower pol had been stored in an Australian terminal. Post-fire investigation showed that such sugar might be more easily ignited and sustain combustion more readily than sugar of higher pol.

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CALENDAR OF EVENTS

FIRE AUSTRALIA + HAZMAT 2016

Risk, Liability, Exposure—Delivering Positive Outcomes

Wednesday 4 and Thursday 5 May 2016, Melbourne Convention & Exhibition Centre

The 2016 conference theme is Risk, Liability, Exposure—Delivering Positive Outcomes. Attendees can expect presentations to focus on these important issues. This year the conference will also include the HazMat Conference, meaning even more attendees, speakers and exhibitors from across the spectrum of fire protection and emergency response, special hazards and dangerous goods. The HazMat presentation stream will run alongside the two Fire Australia streams. The conference dinner will be held at the Melbourne Cricket Ground on the evening of Wednesday 4 May and features a sporting theme. The trade show component will again provide a major highlight and is sure to draw many visitors building on the attendance seen at the record-breaking 2015 event on the Gold Coast.

For all Fire Australia and HazMat information, www.fireaustralia.com.au.

AUSTRALIAN AND NEW ZEALAND DISASTER AND EMERGENCY MANAGEMENT CONFERENCE

Earth, Fire and Rain

Monday 30 and Tuesday 31 May Jupiters Hotel, Gold Coast

The Australian and New Zealand Disaster and Emergency Management Conference will address planning, response and the introduction of innovative techniques in managing disasters, emergencies and hazards. The conference is a joint initiative of the Bushfire and Natural Hazards CRC, the Australian Institute of Emergency Services, the Australian and New Zealand Mental Health Association Inc. and the Association for Sustainability in Business Inc.

Registrations are now open at www.anzdmc.com.au.

AFAC16 POWERED BY INTERSCHUTZ

Mitigation – Response – Recovery: Getting the balance right

30 August to 1 September 2016 Brisbane Convention Centre

Co-produced with the Bushfire and Natural Hazards CRC, the theme and focus of the AFAC16 *powered by INTERSCHUTZ* conference is Mitigation – Response – Recovery: Getting the balance right.

Emergency and disaster management has advanced dramatically over the past five years with fire and emergency service agencies worldwide implementing new and innovative ways to mitigate and respond to disasters.

AFAC16 *powered by INTERSCHUTZ* will attract delegates and visitors from emergency and security services, all levels of government, non-government organisations and research and education organisations from Australia and all over the world.

To register for the premier emergency management conference in Australasia and to access the full program, visit www.afacconference.com.au.

WAYNE MACKEY

Wayne Mackey was appointed Director of Training, New Zealand Fire Service, in February 2016. He was previously General Manager Strategic Programs for the New Zealand Defence Force. He has a strong background in senior operational leadership and has significant training experience in large state-sector organisations.

ANDREW STARK AFSM

Andrew Stark AFSM has been appointed a Deputy Chief Officer with the Country Fire Service, South Australia. Andrew was previously the Chief Officer with the ACT Rural Fire Service, a role he held since 2009.

STEVE ROTHWELL ASFM

Steve Rothwell AFMS retired in March 2016 from the role of Chief Fire Officer and Director at the Northern Territory Fire and Rescue Service after serving as a firefighter for almost four decades. His fire service career began on 1 September 1977 with the ACT Fire Brigade before he moved to Mackay and the Queensland Fire and Rescue Service (QFRS) in November 1993. In 2002 he was promoted to the rank of Assistant Commissioner for the South Western Region. Prior to leaving QFRS, Steve occupied the role of Assistant Commissioner Rural Operations, where he was responsible for and provided leadership to the State's Rural Fire Service and its 34,000 volunteers. In 2011, Steve became Chief Fire Officer and Director, Northern Territory Fire and Rescue Service.

PATRICK CONWAY

FPA Australia is proud to announce the appointment of Mr Patrick Conway as a new co-opted Director to the Association's Board. Mr Conway is electrically trade qualified and holds a Bachelor of Business in Marketing and International Trade from Victoria University. He has extensive experience in the fire industry that has included senior business development and sales management roles with UTC. He is the ANZ Sales Director for Tyco Fire Protection Products. FPA Australia congratulates Mr Conway on his appointment and look forward to his continued contribution to the Association and the fire protection industry.

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CORETEXT

BY **IAN FINDLAY**

Technical Coordinator, FPA Australia

STANDARDS AUSTRALIA

FP-001 Maintenance of fire protection equipment

The AS 1851-2012 Amendment 1 public comment period closed 2 February 2016. FP-001 met in late March to resolve the public comment received.

FP-002 Fire detection and alarm systems

AS 1670.1:2015 and AS 1670.4:2015 were published in December 2015 and have been adopted in the BCA 2016, which takes effect on 1 May 2016.

Public comment on AS 1670.5 *Special hazards systems* closed 8 January and the received public comment has been reviewed. AS 1670.5 is expected to be published in the next few months.

AS 4428.4 *Intercommunication systems for emergency purposes* and AS 7240.4 *Power supply equipment* were both released for public comment in late December 2015, which closed on 24 February 2016.

The project proposals for revisions of AS 1603.3 (heat alarms), AS 1670.3 (fire alarm monitoring) and AS 4428.6 (alarm signalling equipment) have all been approved.

FP-004 Automatic fire sprinkler installations

Work continues on the draft revision of AS 2118.1 *Automatic fire sprinkler systems – General systems* with the aim of publication in 2016.

FP-009 Fire hydrant installations

The re-release of AS 2419.1 *Fire hydrant installations – System design, installation and commissioning for combined procedure* remains stalled.

FP-011 Special hazard fire protection systems

Project proposals for the revision of AS 14520 (to be recombined and redesignated AS 4214) and AS 4487 (aerosol systems) have been approved.

FP-018 Fire safety

The new standard AS 5113 *Fire propagation testing and classification of external walls of buildings* is expected to be published shortly.

FP-018 continues to work 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-019 Passive fire protection

AS 1905.1:2015 has been adopted in the BCA 2016, which comes into effect from 1 May 2016.

FP-020 Construction in bushfire prone areas

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

FP-022 Fire protection of mobile and transportable equipment

The revision of AS 5062 *Fire protection for mobile and transportable equipment* is expected to be published in the next few months.

LG-007 Emergency lighting in buildings

LG-007 continues to revise the AS 2293 suite of standards for emergency escape lighting and exit signs.

TECHNICAL AND ADVISORY GROUPS AND SPECIAL INTEREST GROUPS

TAC/1 Maintenance of fire protection systems and equipment

TAC/1 assisted the FPA Australia technical department to develop and submit FPA Australia's response on the AS 1851-2012 Amendment 1 public comment draft.

Development of a Good Practice Guide on baseline data continues to remain on hold as this topic is to be addressed in the draft amendment to AS 1851-2012.

TAC/2 Fire detection and alarm systems

TAC/2 is awaiting the report from the Senate Inquiry on *Use of smoke alarms to prevent smoke and fire related deaths*, which, at the time of writing, is expected to be released on 30 June 2016.

TAC/2 continues to contribute to FP-002 projects including revisions of AS 4428.4 and AS 7240.4.

TAC/3/7 Portable and mobile equipment

No TAC/3/7 meeting was held during the current round of TAC meetings. However, Information Bulletin (IB-13) *Frequently Asked Questions: Portable fire extinguishers* has now been published.

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

Information Bulletin *Isolation valves in fire sprinkler and fire hydrant systems* was published in December 2015.

TAC/4/8/9 is working on the development and submission of a project proposal to amend AS 2304-2011 *Water storage tanks for fire protection systems*. This proposal reflects the desired changes from our Position Statement (PS-06) *Water storage tanks for fire protection systems*.

TAC/11/22 Special hazards fire protection systems

TAC/11/22 continues to work on a number of technical documents including one on oxygen reduction fire prevention systems and a new document on vehicle system service technician competency. The project proposals submitted by TAC/11/22 for revision of AS 14520 (to be redesignated AS 4214) and AS 4487 have been approved.

TAC/17 Emergency planning

TAC/17 has developed a project proposal for amendment of AS 3745 *Planning for emergencies in facilities* to include guidelines on lockdown procedures and response to armed intruder events as well to update the evacuation diagram and other requirements in response to industry implementation and feedback on the standard. This was submitted during the March project prioritisation and selection period.

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

The primary focus of TAC/18 and TAC/19 remains the Good Practice Guide on fire stopping systems. Work continues on other projects including a document on access panels.

TAC/20 Bushfire safety

No TAC/20 meeting was held during the current round of TAC meetings.

TAC/T

TAC/T continues to monitor the effect of the restructure of the Skills Councils and how this will affect the development or revision of training packages, qualifications or units of competency relevant to fire protection.

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The Auto-Test VSR is a new and innovative way of performing a flow test without flowing water. The sprinkler system remains unopened during testing, which promotes water conservation and reduces corrosion caused by the introduction of fresh water.

The Auto-Test VSR can replace any existing flowswitch* and will work with most building automation systems.

The servo mechanism trips and releases the paddle, simulating flow and sending the status to the monitoring system, all while the system remains closed. Potter's proprietary algorithm ensures water is present in the system.

For more information on how the Auto-Test VSR promotes water conservation, please visit us at:

www.PotterSignal.com/auto-test

**Additional power required*

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