

# FIRE AUSTRALIA



**Predicting  
the weather:  
when fires  
cause storms**

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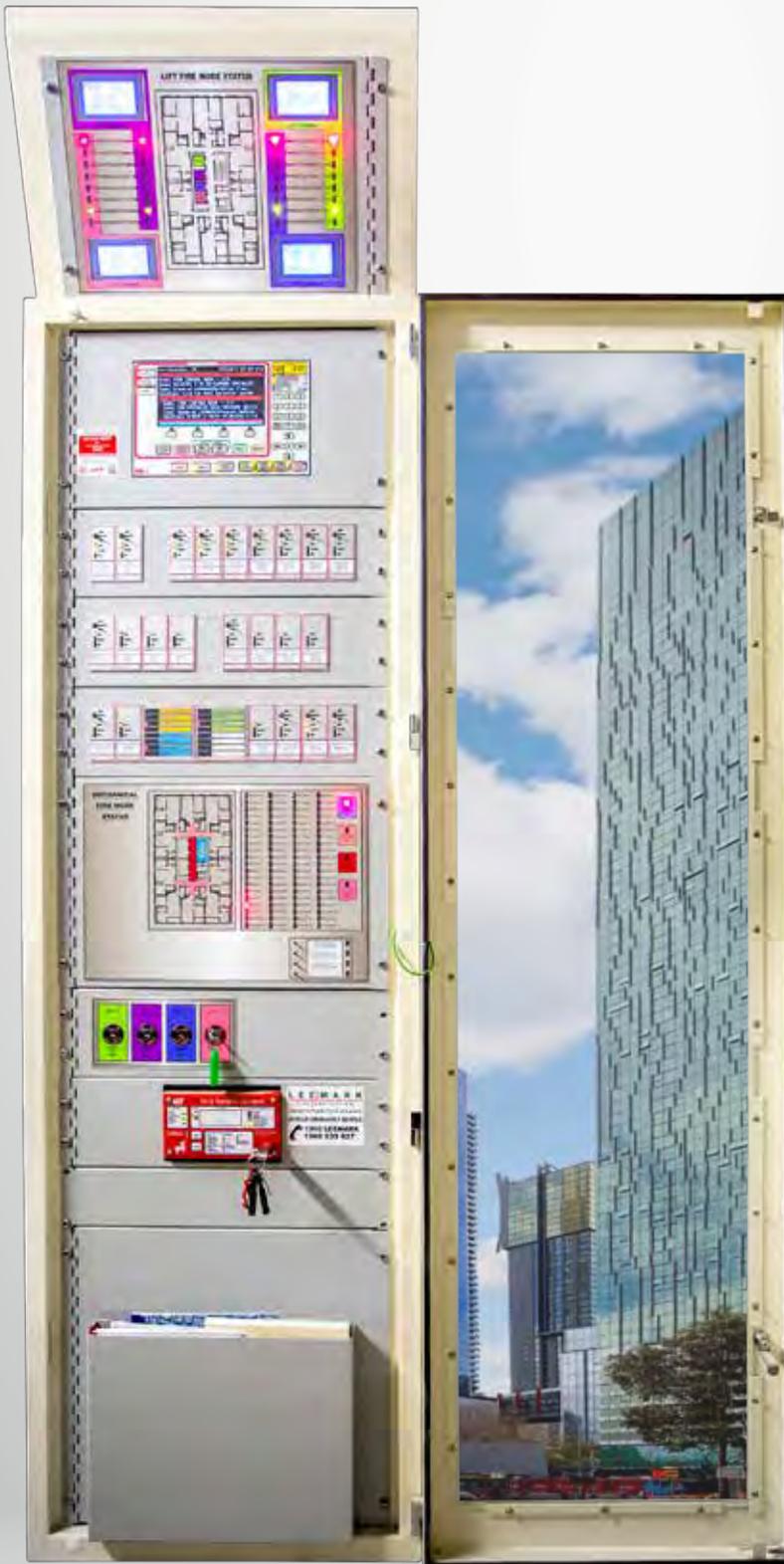
**New warning  
systems, better  
community  
safety**

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**Could paper  
folding deliver  
better individual  
safety?**

## Embracing professionalism

**The importance of industry-  
based accreditation**



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*PHOTO: One of two networked 40U F220 fire panels at Melbourne's 78-storey Victoria One apartment building.*



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# IMPROVING THE INDUSTRY

**NATHAN SEMOS**

CHIEF TECHNICAL OFFICER



Traditionally, the fire industry has had challenges with poorly defined roles and unclear processes, allowing almost anyone with 'a ute and a tool belt' to set up as a fire protection practitioner.

This creates a 'race to the bottom' in a highly competitive market, with the potential for cost-cutting measures leading to lower-quality services. While clients may benefit from cheaper prices, it is at the expense of quality—you get what you pay for.

Some providers, however, are setting their benchmark on quality with expertise to serve the industry well, and we at Fire Protection

Association Australia (FPA Australia) support this.

Continual improvement is important—attitudes, practices and skills need to change if the industry is to remain reliable and trusted. As a result, we developed the Fire Protection Accreditation Scheme (FPAS) to establish what is expected of designers, systems certifiers, routine service technicians and fire safety assessors.

FPAS was created to lift professionalism, increase skills and deliver a career pathway for practitioners within the industry.

Two classes of accreditation—fire systems design (FSD) and fire safety assessment (FSA)—have now been accepted as mandatory in NSW, with the formal recognition of FPA Australia as an accreditation authority under the *Building and Development Certifiers Act 2018*. These provide a transitional pathway for practitioners performing design and assessment work, with a requirement that all become fully qualified within four years.

As noted on page 6 of this edition, the FPAS qualified pathway for FSD and FSA is being finalised and more information will be released soon about what practitioners will need to do. This pathway will ensure that practitioners have the appropriate skills and training for the roles they are performing, inspiring greater confidence in the design and ongoing performance of fire protection systems.

However, it is important to set this as part of an overall review of the industry. FPA Australia is currently developing a framework for fire protection that will see clear minimum benchmarks for skills training in every fire safety measure, whether someone is a designer, installer, systems certifier, maintainer, routine service technician or fire safety assessor.

This will be put out for consultation and, when finished, will provide a career roadmap for anyone wishing to participate in the fire protection industry.

The aim is to give peace of mind to clients that the people they rely upon are appropriately trained for the work they are performing, so the community can continue to be confident that the buildings they occupy are safe.

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# FIRE AUSTRALIA



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Accreditation increases professionalism and skills, while improving the competence of fire protection practitioners.

PHOTO: FPA AUSTRALIA

## 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: [magazine@fpaa.com.au](mailto:magazine@fpaa.com.au). For more details on submitting a contribution, please contact the editors.

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# BLACK SUMMER RECOMMENDATIONS ADD TO KNOWLEDGE



PHOTO: BUSHFIRE AND NATURAL HAZARDS CRC

Number of inquiries by hazard type in the Inquiries and Reviews Database.

All recommendations from the reviews into the Black Summer bushfires have now been added to the Inquiries and Reviews Database, ensuring an even richer source of data to learn from.

With the addition of the five 2020 inquiries into the Database, the total number of inquiries available is now 315, dating back to 1886 and covering all states and territories. Importantly, users can now custom-search all 4,194 recommendations and identify important topics to focus on.

The new inquiries are:

- ◆ **Federal:** Royal Commission into National Natural Disaster Arrangements 2020
- ◆ **NSW:** Final Report of the NSW Bushfire Inquiry 2020

- ◆ **Victoria:** Inquiry into the 2019–20 Victorian Fire Season: Summary Report Phase 1—Community and sector preparedness for and response to the 2019–20 fire season
- ◆ **SA:** Independent review into the 2019–20 bushfire season
- ◆ **ACT:** Report to the Minister for Police and Emergency Services on ACT Government Coordination and Response During the 2019–20 Bushfire Season.

Launched in October 2019 by the Bushfire and Natural Hazards CRC, the Inquiries and Reviews Database codes all recommendations into categories, allowing users to search and compare recommendations through keywords and themes.

For example, a search for bushfire inquiries in the Database shows that, since 2003, there have been 82 inquiries, resulting in 1,748 recommendations. The 'doctrine, standards and reform' classification has the most recommendations (254). 'Emergency management agency and authority' and 'Incident Management Teams' have also had many related recommendations, with 110 and 88 respectively.

CRC CEO Dr Richard Thornton said that the Database had been an accessible and useful resource for agencies since its release.

"The Database serves as a platform to help government and emergency management agencies recognise past lessons and identify effective practices, both now and into the future," Dr Thornton said.

"The recent updates in particular are more relevant than ever and ensure that practitioners can access the important information in one location, comparing findings from the Black Summer inquiries with those such as the 2010 Victorian Bushfires Royal Commission or the 2003 ACT bushfire inquiry."

The Inquiries and Reviews Database is an outcome of the CRC's Tactical Research Fund project, *Major post-event inquiries and reviews: review of recommendations*, completed in 2017. ■

Explore the database at <https://tools.bnhcrc.com.au/inquiries>

# CLIMATE CHANGE AND DISASTERS

The AFAC report *Climate Change and Disasters: Key Messages and Resources* supports clear and consistent messaging about climate change.

The AFAC Climate Change Group has prepared a new publication, *AFAC Climate Change and Disasters: Key Messages and Resources*, to provide an authoritative and agreed source of information relating to climate change.

Fire and emergency services are significantly affected by climate change as there is an associated increase in the scale, intensity and frequency of climate-driven emergency events to which communities and the environment are exposed.

AFAC and its members play an important role in mitigating this exposure. The resource is designed to assist AFAC members to prepare consistent communications and messaging about climate change. ■

Find the resource on the AFAC website: [www.afac.com.au/docs/default-source/publications/afac-climate-change-and-disasters\\_key-messages-and-resources\\_nov-2020.pdf](https://www.afac.com.au/docs/default-source/publications/afac-climate-change-and-disasters_key-messages-and-resources_nov-2020.pdf).

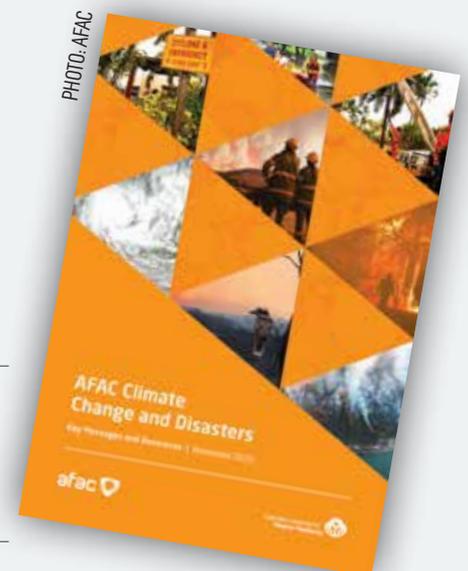


PHOTO: AFAC



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## THE MOVE TO A QUALIFIED PATHWAY FOR ACCREDITATION

**A**s part of the rollout of FPAS in NSW, Fire Protection Association Australia (FPA Australia) is finalising a qualified pathway to accreditation.

FPA Australia was approved as an accrediting authority by the Secretary of the NSW Department of Customer Service on 1 July 2020.

This recognition related to two categories of accreditation:

- ◆ Fire Systems Design (FSD) for the endorsement of plans and specifications under clauses 136AA and 146B of *Environmental Planning and Assessment Regulation 2000*
- ◆ Fire Safety Assessment (FSA) for the endorsement of fire safety measures on an annual fire safety statement, under Part 9 Divisions 5 and 7 of the *Environmental Planning and Assessment Regulation 2000*.

The Secretary has stipulated that accreditation is only to be granted on a transitional basis for a period of 12 months following approval, after which time only qualified practitioners could be accredited.

From 1 July 2021, therefore, the transitional pathway will no longer be available to designers and assessors working in NSW.

Any new applicant who has not obtained transitional accreditation for any particular essential fire safety measure (EFSM) by 11.59 pm on 30 June 2021, will have to meet the qualified accreditation requirements instead to be accredited for those measures.

Practitioners seeking to obtain accreditation are therefore encouraged to complete all of their exams and submit all relevant information to FPA Australia as soon as possible.

These requirements will apply for new applicants post 30 June 2021, but those who hold transitional accreditation will have four years to become qualified, dating either from the day they were accredited or 1 July 2020, whichever is later. ■

**For more information, visit the FPA Australia website:**  
<http://www.fpa.com.au/fpas/fire-systems-certification.aspx>.

Please note that this only applies to designers and assessors working in NSW. All other fire protection roles are unaffected by this change.



PHOTO: AFAC



AFAC continues to work alongside the Male Champions of Change to progress gender equity and diversity in the fire and emergency services.

## GENDER DIVERSITY IN EMERGENCY SERVICES: THE CASE FOR CHANGE

**M**ale Champions of Change (MCC) Fire and Emergency Group and AFAC have jointly produced a compelling report demonstrating the case for gender balance in the fire and emergency sector.

MCC Fire and Emergency Group and AFAC members have been collaborating since 2017 on gender equality initiatives. Over the past three years, there has been progress in terms of an increase in women's leadership. However, across the sector the overall pace of change has been slow, and gender and other diversity gains remain difficult to achieve.

"As industry chiefs, and Male Champions of Change, we are sending a message to the fire and emergency services sector that women are a part of our life, and women are part of the fire and emergency services," Resilience NSW Commissioner Shane Fitzsimmons said. "There should be no impediment to women playing

a meaningful role—and taking up leadership roles—in any aspect of the work we do."

The new report, *Gender Balance in Fire and Emergency: going beyond 'it's the right thing to do'—the case for change*, explores the benefits of addressing key risk factors, including health and safety, reputational and political risk and community engagement, through improving gender balance and other diversity in the sector.

In the report, leaders from across the fire and emergency sector address common questions such as 'why does the gender composition of our workforce matter?' and 'why should we dedicate time to this issue in particular?' to help present the case for change. ■

**Read the report online:**  
<https://championsofchangecoalition.org/resource/gender-balance-in-fire-and-emergency-going-beyond-its-the-right-thing-to-do-the-case-for-change>.

# BUILDING BETTER PLANS TO SURVIVE FUTURE DISASTERS

**H**ow can we improve governance to reduce disaster damage? This was the focus of the 2020 United Nations' International Day for Disaster Risk Reduction, held around the world on 13 October.

The Bushfire and Natural Hazards CRC acknowledged the occasion with an online event, themed 'It's All About Governance', featuring Craig Reucassel from ABC TV's three-part documentary series, *Big Weather (and how to survive it)*, which launched on the same day.

"It's an ideal conversation to be having on this day—*Big Weather* looks exactly at this issue, of how we reduce the risk of disaster events, and it pulls on a lot of the knowledge that [the sector] has contributed to this space," Mr Reucassel said.

Asked what Australia should focus on to accelerate disaster risk reduction, Mr Reucassel shared some of the key insights he learned from the community while filming *Big Weather*.

"More education, getting more people to engage more actively, not just in the back of their mind, about the threats that are coming, is the way forward. That needs coordination at the state and federal level, and it needs education, advertising, people going into schools. I know this already happens, but we need more of that kind of stuff to make sure it moves from that back-of-mind to being really front-of-thought and really practised."

The online event, which had more than 260 people watching across Australia, emphasised the importance of effective collaboration across government, community groups and the private sector, including the role of media companies such as the ABC in helping people and organisations understand resilience and how they can improve it.

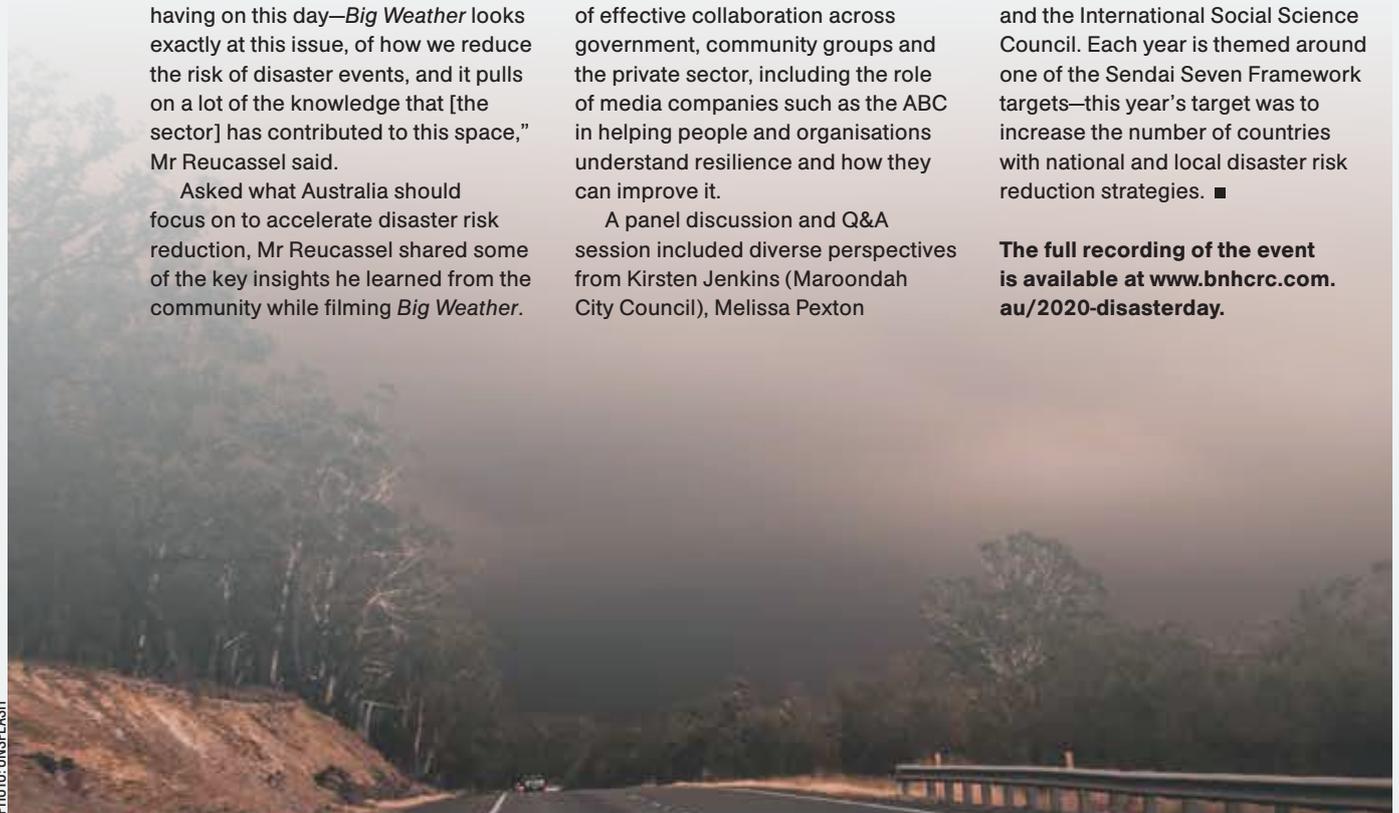
A panel discussion and Q&A session included diverse perspectives from Kirsten Jenkins (Maroondah City Council), Melissa Pexton

(Department of Fire and Emergency Services WA), Professor Lisa Gibbs (University of Melbourne), John Richardson (Australian Red Cross) and Stephen Oliver (ABC), who discussed the importance of ongoing resilience research when seeking to understanding the impact of disasters and governance on Australians' everyday lives.

The International Day for Disaster Risk Reduction is backed by the United Nations International Strategy for Disaster Reduction, the International Council for Science and the International Social Science Council. Each year is themed around one of the Sendai Seven Framework targets—this year's target was to increase the number of countries with national and local disaster risk reduction strategies. ■

**The full recording of the event is available at [www.bnhcrc.com.au/2020-disasterday](http://www.bnhcrc.com.au/2020-disasterday).**

PHOTO: UNSPLASH



## NEW QBCC LICENCE RULES COMING IN FOR FIRE PROTECTION WORK

Late last year, changes were made to the Queensland Building and Construction Commission's (QBCC's) fire protection licensing framework.

Commencing on 1 May 2021, the new framework will introduce:

- ◆ five streams of fire protection licences
- ◆ new licence classes (in design and passive fire protection)
- ◆ changes to 'fire protection work' regulated by the QBCC

- ◆ changes to the fire safety professional licence.

The five licence streams will rationalise existing classes to align them with similar functions and types of work.

They will be in the areas of passive; special hazard fire systems; water-based fire systems; portable fire equipment; and electrical fire systems.

Each will cover design, certification, installation and maintenance, and

inspection and testing functions.

Technical requirements for those wishing to apply for a licence after 1 May 2021 are yet to be released, but all relevant information will be available from the QBCC website at [www.qbcc.qld.gov.au/new-laws/changes-fire-protection-licensing](http://www.qbcc.qld.gov.au/new-laws/changes-fire-protection-licensing). A detailed analysis of the changes and their implications will be made available on the FPA Australia website soon.



PHOTO: IAWF

**The Australian 'Research' 2020 magazine**

Four Bushfire and Natural Hazards CRC researchers have been named as research leaders of four different fields in *The Australian 'Research'* magazine for 2020, illustrating the quality of researchers the CRC draws from.

CRC project leader Professor Jason Sharples (University of New South Wales) has been named the top researcher in the forests and forestry field. Professor Sharples' CRC research continues to produce fundamental insights into extreme fire behaviour and fire spread over complex terrain.

Professor Albert van Dijk (Australian National University) was named research leader of the hydrology and water resources field. Professor van Dijk's research has been key to developing the CRC's near-real-time flammability data service, the Australian Flammability Monitoring System, to support fire risk management and response activities.

Professor Douglas Paton (Charles Darwin University) was named the lead researcher in the emergency management research field. Professor Paton's CRC research traverses community, environmental, health and cross-cultural psychology to inform policy and practice regarding natural and health hazards.

The top researcher in the sustainable development field was Professor Robert Costanza (Australian National University), whose research illustrates that to better inform regional development policy, there still needs to be appropriate valuation of ecosystem services from north Australian savannahs, including recognition of socio-cultural services and well-being benefits incorporating Indigenous values.

**Engineering Associate of the Year Award**

Ian Fitzpatrick, Manager Network Risk Strategy at Essential Energy and CRC end user, has been awarded the Engineering Associate of the Year Award for his contributions to bushfire prevention and his leadership in collaborative, industry-informed research that helps Australian electricity networks better understand and address the risks that natural hazards pose to network assets.

Congratulations to Dr Filkov, Mr Cooper, Dr Tory, Professor Sharples, Professor van Dijk, Professor Paton, Professor Costanza and Mr Fitzpatrick on the recognition and acknowledgement of their work. ■

**AWARDS RECOGNISE OUTSTANDING ACHIEVEMENTS BY CRC EXPERTS**

Dr Alex Filkov (left) and Neil Cooper (right) with their 2020 IAWF awards.

Over the past few months, Bushfire and Natural Hazards CRC researchers and end users have been recognised with prestigious awards, both in Australia and internationally.

**Early Career Award in Fire Science**

Dr Alexander Filkov, CRC researcher and Senior Research Fellow at the University of Melbourne, was awarded the 2020 Early Career Award in Fire Science by the International Association of Wildland Fire (IAWF) for his research. This covers a wide range of fire behaviour topics including the ignition and combustion of fuels, the spread of wildfire and transition mechanisms to the wildland-urban interface, and the performance of structural materials under different fire conditions.

**Firebreak Award for Excellence in Wildland Fire Management**

The IAWF 2020 Firebreak Award for Excellence in Wildland Fire Management was awarded to Neil Cooper, Manager of Fire Management at ACT Parks and Conservation Service.

Neil has been a lead CRC end user since the inception of the *Mapping bushfire hazards and impacts* project and was also involved with the Bushfire CRC as the lead end user of the *Fire in the landscape* project. He has made a defining contribution to modern fire management in the ACT and his influence extends across the globe.

**Insight and Innovation Award**

CRC researcher Dr Kevin Tory from the Bureau of Meteorology has been recognised with an Insight and Innovation Award for his work on the Pyrocumulonimbus Firepower Threshold (PFT), which you can read more about on page 16. Dr Tory received the Bureau of Meteorology's award for his research into how fire-generated thunderstorms form and can be predicted.

Using the PFT, severe weather forecasters now better understand the conditions that lead to pyrocumulonimbus clouds and extreme fire behaviour, which helps generate more accurate and faster warnings for communities.



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# DEVELOP YOUR SKILLS WITH THE VOLUNTEER LEADERSHIP PROGRAM

The Volunteer Leadership Program (VLP) equips emergency sector volunteers with the skills and confidence to grow as leaders. Dates for programs across Australian states and territories have been released for 2021.

The VLP experience is immersive and collaborative, bringing together volunteers from different organisations and agencies to build knowledge and share experiences with each other.

The program explores practical leadership frameworks through interactive learning, and participants gain self-awareness and an enhanced ability to understand and contribute to their organisations. ■

**Find out more about the VLP, or apply to attend, at the Australian Institute for Disaster Resilience website: [www.aidr.org.au/programs/volunteer-leadership-program](http://www.aidr.org.au/programs/volunteer-leadership-program).**

## VLP schedule for 2021

Location	Program dates	Application due date
Perth, WA	19–21 March 2021	5 February 2021 (closed)
Adelaide Hills, SA	21–23 May 2021	9 April 2021
Darwin, NT	18–20 June 2021	7 May 2021
Townsville, Queensland	23–25 July 2021	11 June 2021
Port Macquarie, NSW	6–8 August 2021	25 June 2021
Canberra, ACT	10–12 September 2021	30 July 2021
Bendigo, Victoria	15–17 October 2021	3 September 2021
Hobart, Tasmania	12–14 November 2021	1 October 2021

# EPA NZ AMENDMENT OF ITS FIRE FIGHTING CHEMICALS GROUP STANDARD

The Environmental Protection Authority in New Zealand (EPA NZ) has recently completed an amendment to its *Fire Fighting Chemicals Group Standard 2017* that aims to phase out the use of firefighting foam that contains PFAS compounds.

Consultation first began in September 2019, and after multiple rounds of consultation the final amendment was approved on 14 December 2020.

This amendment introduces the following changes:

- ◆ importers and/or manufacturers must notify EPA NZ of the composition of any firefighting foam product upon its first import/manufacture (or any change of composition) and before supply
- ◆ all foam products shall be supplied labelled (or with accompanying documentation) with its fluorine content (including if 0%)
- ◆ a person must take all reasonable care to contain firefighting foams (regardless of fluorine content)
- ◆ requirements introduced to transition away from legacy PFAS

firefighting foams (containing PFOA-related compounds) and C6 fluorotelomer firefighting foams

- ◆ the transition period for legacy foams is two years for uncontained systems and five years for contained systems
- ◆ the transition period for C6 foams is five years, after which people may apply to the EPA NZ for an exemption to continue to use such foams
- ◆ a person must not use PFAS firefighting foams (either legacy or C6) for training
- ◆ a person may continue to use PFAS firefighting foams (either legacy or C6) for testing if all releases are contained
- ◆ if changing a system from PFAS firefighting foams, a person must thoroughly clean the system and dispose of any residual foam or waste product appropriately
- ◆ foams and waste products must be disposed of by high-temperature incineration or other approved methods.

These changes are in line with similar approaches undertaken in Queensland and Europe. ■

Visit [www.epa.govt.nz](http://www.epa.govt.nz) for more information and to view the Standard and the decision to amend it.



PHOTO: MELINA PEARSE, NORTH AUSTRALIAN INDIGENOUS LAND AND SEA MANAGEMENT ALLIANCE



## BUILDING CAPACITY IN NORTHERN AUSTRALIAN COMMUNITIES

Day 1 of the Northern Australia Research Engagement Forum at Charles Darwin University.

**H**ow can we build capacity and community resilience in northern Australia? This was the focus of the Northern Australia Research Engagement Forum, hosted by the Bushfire and Natural Hazards CRC in conjunction with Charles Darwin University (CDU) on 12 November 2020.

The forum was a hybrid event, with an in-person conference room available for people who could be in Darwin and a live online broadcast for the rest of Australia to tune into. The forum provided 11 researchers in Darwin and around Australia with an opportunity to share the findings of their CRC projects that connect local and national developments in research and emergency management in the NT, Queensland and WA.

The event was opened by Adjunct Professor Jeremy Russell-Smith (CDU), research leader of the *Developing effective emergency management partnerships in remote northern Australian communities* and *Scenario planning for remote community risk management in northern Australia* projects. He gave an overview of the northern Australia-focused core research projects and briefly explained the two phases that have been conducted to help build community resilience in northern Australia.

"The research we've done over the past seven years in northern Australia is not just about responding to big events, it's about thinking about preparatory actions and planning that needs to be undertaken throughout the entire year," Adjunct Professor Russell-Smith said.

The rest of the event saw the ten presenters provide detailed explanations of a range of research outputs from the CRC's northern Australia projects. Topics included the Savanna Monitoring and Evaluation Reporting Framework, earth observations for fire detection using the Himawari satellite, costing natural disasters and assessing cost-effective community solutions, lessons in effective on-ground engagement in emergency management, cultural authority in fire and land management, the Workforce 2030 project and the *Cultural land management* project proposal. ■

The full recording of the forum is available to watch in nine parts at [www.bnhcrc.com.au/events/2020-north-australia-research-forum](http://www.bnhcrc.com.au/events/2020-north-australia-research-forum).

"The research we've done over the past seven years in northern Australia is not just about responding to big events, it's about thinking about preparatory actions and planning that needs to be undertaken throughout the entire year."

Adjunct Professor Jeremy Russell-Smith



PHOTO: AFAC

## COLLABORATIVE RESEARCH RECOGNISED WITH GOVERNMENT GRANT

Dr Steven Curnin presenting at AFAC19 powered by INTERSCHUTZ, August 2019.

**R**esearch about improving decision-making of emergency management teams in crisis situations has been recognised with a prestigious Australian Government grant.

Bushfire and Natural Hazards CRC researcher Dr Steven Curnin (University of Tasmania) has been awarded a research grant under the Discovery Early Career Research Award for 2021, which will allow him to continue collaborating effectively with emergency management agencies.

Dr Curnin has been involved with the current CRC and previous Bushfire CRC for many years—as a researcher on the *Improving decision-making in complex multi-team environments* project, examining specific characteristics of the strategic decision-making process, as

well as his PhD study, through which he developed a conceptual framework of the core requirements of liaison officers working at state-level control centres.

As Director of the Disaster Resilience Research Group at the University of Tasmania, Dr Curnin and his colleagues also conduct regular masterclasses drawing on his CRC research for the critical infrastructure sector, emergency managers and local councils on how to optimise decision-making. Dr Curnin's research also informs a decision-making guide released by the Australian Government Department of Home Affairs.

Alongside fellow CRC and University of Tasmania researcher Associate Professor Ben Brooks, Dr Curnin has also developed a set of easy-to-use cognitive decision tools and training

aids to help improve decisions in emergencies. The Psychological Safety Checklist can be used to create a psychologically safe decision-making environment. The Cognitive Bias Aide Memoire can be used by teams to identify cognitive biases in the decision-making process.

CRC CEO Dr Richard Thornton congratulated Dr Curnin on his new grant.

"This Discovery Early Career Research Award is a fantastic recognition of Steve's work over many years. Making the right decisions in high stress emergency environments is critical, and Steve's research has made many contributions to improving this decision-making for emergency managers across Australia," Dr Thornton said. ■

## VET TRAINING IS OK, BUT COULD BE BETTER, ACCORDING TO THE PRODUCTIVITY COMMISSION

The report from the Productivity Commission's National Agreement for Skills and Workforce Development Review has finally been released.

The Commission found that the current vocational education and training (VET) system is not 'in crisis', but has recommended that the current agreement be replaced.

The report suggests that any new intergovernmental agreement should be principles-based and modular, to retain flexibility and currency, and that it be reviewed every five years.

It encourages ongoing government support for a more efficient and competitive VET market that provides better information to users, who need to be advised about career opportunities, the performance of training providers, and the quality and price of courses.

In addition, the system needs to enable faster changes to training packages and there needs to be a phased introduction of independent assessment.

Modest minimum student fees for Certificate III courses and greater contestability of funding to TAFEs were

also proposed, with a suggestion that VET Student Loans be expanded to Certificate IV and Diploma courses, reflecting course costs.

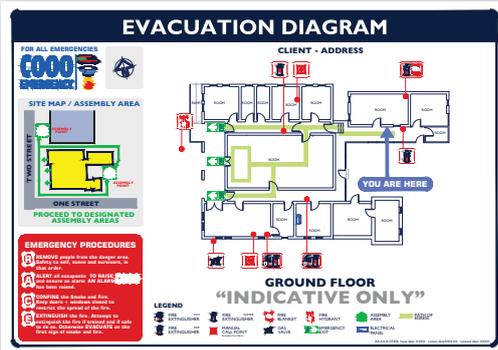
These recommendations were aligned with the suggestion that the trade apprenticeship system be reformed to better screen candidates and be more flexible in subsidising non-apprenticeship pathways. ■

The report can be found at [www.pc.gov.au/inquiries/completed/skills-workforce-agreement/report](http://www.pc.gov.au/inquiries/completed/skills-workforce-agreement/report).

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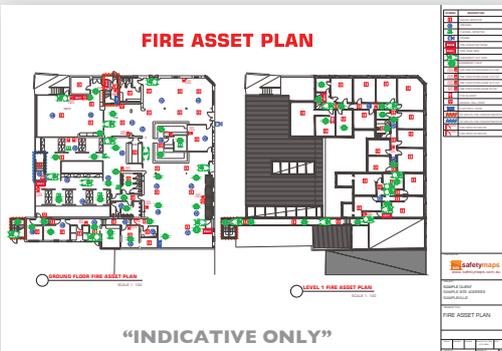
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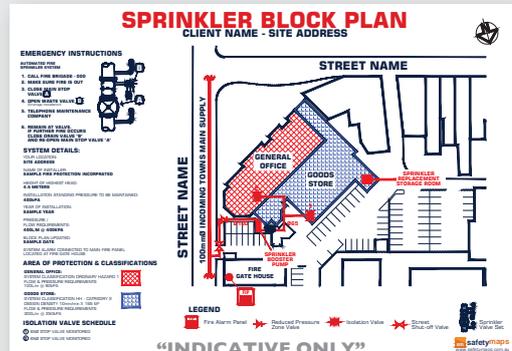
Block Plans that can be printed on any medium of your choice, PVC, Brushed Alloy or Anodised. A3 displaying all necessary information about the buildings hydrant system.

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# The importance of industry-based accreditation

Through coregulation, government and industry will deliver more professional, skilled and reliable fire protection practitioners.

BY **PAUL WATERHOUSE**

FPA Australia

**O**n 1 July last year, the fire protection sector took a great step towards becoming more professional and better supporting its clients.

On that date, the Secretary of the NSW Department of Customer Service formally recognised FPA Australia as an accreditation authority under the *Building and Development Certifiers Act 2018*.

This means that now, with some small exceptions, fire systems designers who endorse plans and specifications or fire safety assessors who assess the performance of fire safety measures must be accredited under the Fire Protection Accreditation Scheme (FPAS).

The product of 18 months of close collaboration between the Association and the NSW Government, the decision to recognise FPA Australia as an accreditation authority implemented the latter's coregulatory model as outlined in its Competent Fire Safety Practitioner Co-Regulatory Accreditation Framework.

As stated by the then Minister for Better Regulation and Innovation, Matt Kean MP, the government saw the coregulatory relationship with industry as "another key step towards ensuring the people of NSW are safe."

It was a part of the minister's 10-point plan to improve fire safety and building outcomes, which recognised that industry expertise was essential to any successful accreditation scheme.

FPA Australia was the first industry body recognised in NSW under this

arrangement, and our experience and efforts have set an industry-wide standard.

This is not the first example of coregulation in this state—the Law Society, for example, has been responsible for regulating its profession since 1996.

However, it is the first time that accreditation or licensing of practitioners in the fire sector has been achieved through coregulation. It is also a great opportunity both for industry and the community: the government gets to set the rules and require regular reporting on progress and compliance, while industry has a chance to identify and implement the standards needed by practitioners, under the department's close watch.

A coregulatory partnership stacks up very well against government-run accreditation and licensing schemes in improving an industry's performance and reliability.

## Registration

Unlike the Law Society, FPA Australia is not accrediting the whole fire protection industry, but has been recognised for the accreditation of fire systems designers (FPAS FSD) and fire safety assessors (FPAS FSA).

Accreditation is open to any practitioners who are currently performing fire system design and assessment work and who can demonstrate competence, whether they are FPA Australia members or not.

This means they have to be vetted, tested and registered.

A publicly accessible register shows what a practitioner can do, outlining:

- ◆ what accreditation they have obtained
- ◆ what measures they are accredited to assess
- ◆ the level of insurance they hold
- ◆ whether there have been any successful complaints against them or any breaches by them.

This allows clients or councils to search for practitioners by name, number or accreditation, to see if they are competent and to satisfy themselves that the practitioner is appropriate for a job.

## Training and qualifications

At the moment FPAS is accepting practitioners on a transitional basis.

This approach was required by the department, which needed to be assured that there would be enough practitioners accredited when the scheme was formally recognised to continue to service its clients.

But it is important to recognise that this is 'transitional' accreditation. We are currently finalising our qualified accreditation pathway, with which all practitioners will have to comply.

From 1 July this year, any applicants for accreditation will only be able to go through the qualified pathway.

More importantly, practitioners holding transitional status will have to be fully qualified within four years of accreditation if they wish to continue performing the role.

Identifying the qualifications has been challenging, given that for some assessment activities there has never been any formal training available.

However, we believe that the qualifications the government has accepted represent a good starting point for improving the quality of practitioners within the industry, which will be lifted over time.

## Ongoing education

On top of the qualifications, all accredited practitioners have to complete continuing professional development (CPD).

A common feature of all professional schemes, CPD ensures that practitioners are required to keep learning and increasing their knowledge. The underlying purpose of this is to ensure that design and assessment work is not seen as an endpoint in itself, but as a para profession where practitioners are constantly seeking to improve the safety and performance of the systems in their care.

## Integrity

To apply for FPAS, all practitioners must sign a Code of Professional Conduct.

This code states the principles, standards of behaviour and service delivery requirements that FPA Australia expects from accredited individuals.

## Signatories must:

- ◆ aim to perform to the highest ethical standards in carrying out their work to



PHOTO: STOCK



PHOTO: FPA AUSTRALIA

maintain community confidence in the integrity of work performed

- ◆ act honestly, ethically, responsibly and with accountability in providing fire protection services.

The integrity of practitioners is fundamental to the safety of the community, and compliance with the code is taken very seriously.

To support this, we have a complaints process that investigates all concerns raised and an auditing program that audits at least 10% of practitioners per year.

This ensures that there is always oversight of accredited practitioners. Several have already been issued with show cause notices and advice will soon be going to the Secretary about the suspension of some accreditations.

Practitioners facing disciplinary action still have the right to appeal to an independent panel if they think they have been unfairly treated.

### Oversight

As an accreditation scheme established under a coregulatory system, FPA Australia is beholden to the NSW Government on all matters:

- ◆ all conditions of the scheme have to be approved and any changes prevetted
- ◆ the Secretary must be advised of any decision about the discipline of any practitioner.

Everything about the scheme has been vetted by the Department of Customer Service through an extensive 18-month review and implementation process, and all decisions and any changes must be approved before they can be introduced.

In addition, government oversight means that FPAS is open to anyone with sufficient competence to do the role, if they can demonstrate their ability to do so.

A coregulatory system of accreditation gives the best of both worlds—rules set and oversight performed by government and implementation carried out by industry representatives, who deal with the industry every day.

### Where to now?

With the impending roll-out of the qualified pathway, FPA Australia is taking another step towards the professionalism and improvement of the fire protection industry.

We have already seen significant changes in the attitudes of practitioners, who are exercising greater caution and are spending more time on their designs and assessments because their livelihood depends on it.

FPA Australia's ultimate goal is to ensure that the whole community can be safe in the knowledge that they are being given the best possible protection from the risk of fire.

Industry partnerships with governments, through coregulation, are the best way of achieving that.

For more information, visit [www.fpaa.com.au/fpas.aspx](http://www.fpaa.com.au/fpas.aspx).



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PHOTO: CHRISTINE HARPER, DBCA, WA

# WHEN FIRES CAUSE STORMS

New technology is now available that predicts fire-generated thunderstorms, prompted by a sharp increase in the number of these storms and associated extreme fire events such as the devastating bushfires they caused in the 2019-20 fire season.

BY **BETHANY PATCH**

Bushfire and Natural Hazards CRC

**F**ire-generated thunderstorms, sometimes called pyrocumulonimbus clouds or pyroCbs, are ferocious weather systems that can exacerbate the damage already caused by the bushfires that create them. While they are only just beginning to be understood, research by the Bushfire and Natural Hazards CRC is helping us measure and predict fire-generated thunderstorms more effectively. This research aims to

improve warning systems and assist agencies with analysis and forecasting.

Dr Kevin Tory, Senior Research Scientist at the Bureau of Meteorology (BOM), is one of the researchers taking part in the CRC's *Improved predictions of severe weather to reduce community impact* project, which is exploring fire-generated thunderstorm prediction. The team's research has developed a new tool that is helping fire agencies and BOM weather forecasters to predict when these dangerous storms might occur, so that fire agencies can warn communities and firefighters.

Dr Tory explains that fire-generated thunderstorms have much in common with conventional thunderstorms—both require warm humid air to be lifted into an unstable layer above. However, far less is known about the former, including why they have become so much more common recently.

"We are getting better at identifying these storms with improved satellite coverage, but this can't explain the dramatic increase in numbers of events we've seen globally in the last few years," Dr Tory said.

According to Rick McRae, who

Above: Fire-generated thunderstorm forming during Lake King fire in WA, February 2020.

has been studying fire-generated thunderstorms for almost 40 years, Australia has entered an era of violent pyro-convection since the first closely studied storm in Berringa, Victoria, in 1995.

“PyroCbs are a very strong signal of how badly climate change is impacting the globe,” he said.

“With normal fires, if you know the fuel, the weather and the terrain, then you know what the fire will be doing, with a few exceptions. A blow-up fire event displays dynamic fire behaviour—they are basically a different species of fire. They develop feedback processes.”

Mr McRae began searching for previous instances of fire-generated thunderstorms in 2003. Prior to 2001, there were two known and two suspected events in Australia. There are now 118 on the list—including 37 during last season’s Black Summer bushfires, which raged through south-eastern NSW and eastern Victoria. This made the Black Summer bushfires the most intense series of pyro-convective events ever recorded.

The smoke from fires near Mallacoota, Victoria, eventually reached a height of 35 kilometres, and is now being studied worldwide. Sergey Khaykin at the Laboratory of

Atmospheric Research and Satellite Observations at Sorbonne University in France recently reported that the smoke was so thick that it acted like a planetary shade, blocking the sun and briefly creating a cooling effect—similar to a moderate volcanic eruption.

Of course, not all extreme fires go on to produce intense new weather events, but conditions can become very ferocious and significantly destructive when they do, often resulting in far-carried embers or the creation of entirely new fires from lightning strikes.

This kind of firestorm occurs when the hot gases in the smoke plume rise high enough to begin interacting with the atmosphere, causing clouds to form and inducing a powerful local thunderstorm.

With the increase in these firestorms, it is becoming easier to identify and predict them with the help of new technologies.

Dr Tory explains that, in some ways, the formation of these storms is very simple to understand. The analysis of fire and plumes is more complicated.

“All you need is an enormously hot fire in an unstable atmosphere and a fire-generated thunderstorm will develop,” he said.

“The real complexity is in

understanding how large and intense a fire would need to become for a specific atmospheric environment, and whether or not you have the right mix of fuels, terrain, local winds and complex fire behaviours that would allow the fire to become large and intense enough.”

According to Dr Tory, a basic understanding of three things is needed in order to understand how large and intense a fire needs to be to create a fire-generated thunderstorm:

1. The height smoke plumes rise for any given fire intensity and wind speed. The greater the fire intensity, the taller and more vigorous the smoke plume, whereas the stronger the wind, the more the plume is blown over and spreads out downwind.
2. The height to which the smoke plume must rise before it cools enough for cloud to start forming. This requires an understanding of how the temperature and humidity changes with height in the smoke plume.
3. The instability of the atmosphere. This determines how buoyant and strong the updrafts in the cloudy plume need to be for a thunderstorm to develop.

A series of CRC studies has helped analyse plume behaviour more accurately. Building on this research,

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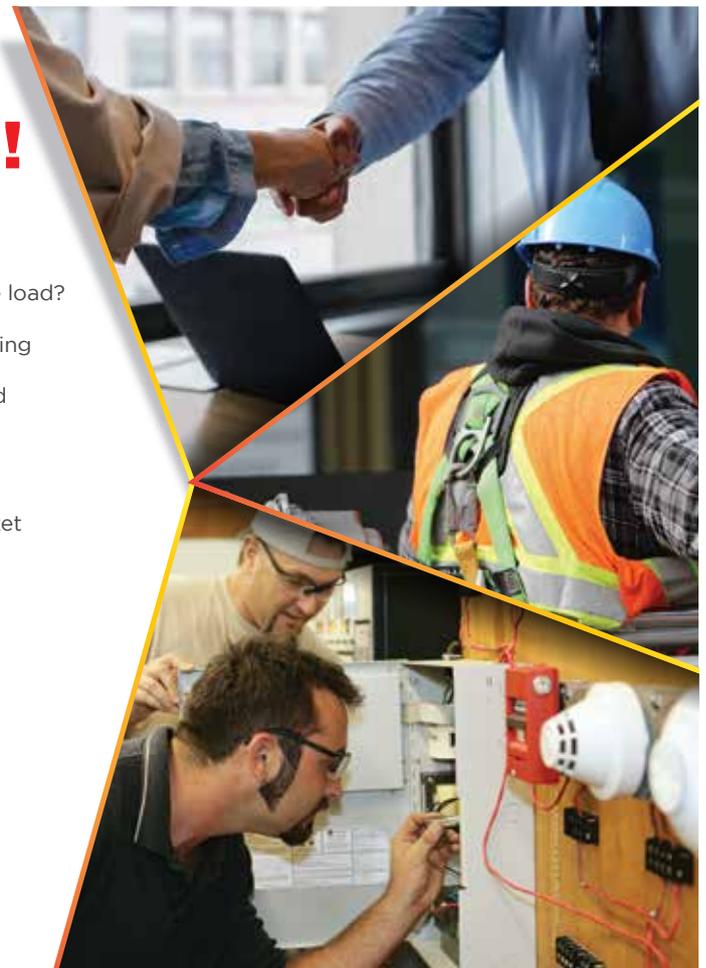
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## The Pyrocumulonimbus Firepower Threshold (PFT) is new technology that measures the threshold or minimum firepower required for fire-generated thunderstorms to form.

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Dr Tory's team at the BOM has been focusing specifically on the first point, in order to understand how large and intense the fire would need to be to produce one of these fierce storms.

"We focus on the atmosphere, which is much more predictable than fire. If we know how large and intense a fire will become, and how large and intense a fire needs to be for a fire-generated thunderstorm to form, we can, in theory, predict them. However, predicting the future fire size and intensity remains an enormous challenge," Dr Tory said.

His work has culminated in the development of a diagnostic tool that can determine when the atmosphere is conducive to both deep plume development and large, hot fires, which is assisting fire agencies and the BOM with accurate and quick predictions that inform subsequent warnings.

The Pyrocumulonimbus Firepower Threshold (PFT) is new technology that measures the threshold or minimum firepower required for fire-generated thunderstorms to form, essentially assessing the atmospheric potential to support the development of a fire sufficiently large and intense for one of these storms to develop. It is proving to be highly predictive.

"We were surprised how well the tool seems to work. We seem to have identified a handful of key ingredients, and the way they fit together largely determines how favourable the atmosphere is for fire-generated thunderstorm formation," Dr Tory said.

The research team began by using a computer-generated weather forecast to create contour maps of the PFT, then handed them out to a selection of fire weather forecasters and fire behaviour analysts.

"We know that a fire-generated thunderstorm can be very hazardous,

but we also know that many are quite benign," said Dr Tory.

"The PFT is great because it helps to pinpoint the threat timing and location."

Within weeks, these maps were being used to predict the Black Summer firestorms. This allowed the researchers to practise using and refining the tool, identifying its strengths and weaknesses and making improvements.

Partnerships with fire and emergency services and other government partners, coordinated through the CRC, have been essential in building and developing the tool. This has helped to make it easier to use, so that it can be actively applied when forecasters and analysts need it the most. The tool is now used by fire behaviour analysts within fire agencies and land management departments, as well as by BOM forecasters, who work closely with fire agencies advising on severe weather.

Jamie Molloy, a fire behaviour analyst and Program Manager of the Forest Protection Survey Program at the Victorian Department of Environment, Land, Water and Planning, explains just how helpful the PFT has been for his team when analysing fires.

"The Pyrocumulonimbus Firepower Threshold is a significant improvement in identifying fire-generated thunderstorm risk, including helping to flag other factors that should be looked at, such as mixed-layer windspeed," Mr Molloy said.

"I review it every day that I am deployed as a fire behaviour analyst. It gives me a very quick heads-up on the potential, broad timing and location of fire-generated thunderstorms—if the chance of a storm is identified, it prompts further investigation of ignition potential, atmospheric instability and thus the likelihood of firestorms and community risk in those areas."

In Western Australia, the tool has been used by the Department of Biodiversity, Conservation and Attractions during the past two southern fire seasons. Brett Beecham, having worked in intelligence and predictions for the Department for the past ten years, reiterated how helpful the PFT was when assessing pyro-convection and the risk of extreme fires.

"The Pyrocumulonimbus Firepower Threshold provides one more piece of information about the potential for a fire to interact with the atmosphere around it, and I now use it in conjunction with other tools to gain a better insight into the risks of extreme fire behaviour," he said.

"It provides vital information about the likelihood of extreme fire behaviour due to strong pyro-convection, and this ultimately leads to improved firefighter and community safety during a bushfire."

The PFT is also being regularly used by NSW Rural Fire Service fire analysts such as David Philp.

"From the perspective of a fire behaviour analyst for an incident management team, knowing the possible potential storm risk triggers the need for closer monitoring of the broader weather conditions to ensure appropriate storm warnings are issued, rather than waiting for specific warnings being issued through the Rural Fire Service State Operations Centre," he said.

The tool will continue to be improved and expanded as more evidence comes to hand. Dr Tory and other scientists are racing to learn as much about fire-generated thunderstorms and other extreme weather systems as possible, knowing that a better understanding is essential to reducing preventable fire-related deaths.

"If we knew more about what makes fire-generated thunderstorms dangerous, we should be able to tailor some of the ingredients or adjust thresholds to better highlight dangerous events. More field studies—with every type of monitoring equipment we can think of – will help us better understand these events," Dr Tory said. ■

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**To learn more about this research, visit [www.bnhcrc.com.au/research/predictingsevereweather](http://www.bnhcrc.com.au/research/predictingsevereweather).**



PHOTO:AFAC

# INTRODUCING THE AUSTRALIAN WARNING SYSTEM

The Australian Warning System is a new national approach to information and warnings for hazards such as bushfire, flood, storm, cyclone, extreme heat and severe weather.

BY **ALANA BEITZ**

AFAC

**T**he Australian Warning System has been developed by the AFAC Warnings Group and is based on community research and input from Australia's emergency service and hazard agencies. It was launched on 1 December for bushfires and over the next two to three years it will be progressively implemented for other hazard types around the country.

A major study across the country saw more than 14,000 people surveyed or interviewed to help identify improvements to make warnings clearer and lead people to take action during hazard events. Basing the design of the Australian Warning System on this extensive research will ensure it is understood by, and resonates with, community members across the country.

The system uses a nationally consistent set of icons to show incidents

on fire and emergency service agencies' websites and apps, supported by calls to action. The three levels of warning—Advice, Watch and Act, and Emergency Warning—are accompanied by colour-coded icons—yellow, orange and red. They also come with clear calls to action to assist communities to act in response to an emergency event.

Until now, there have been different warning systems for different hazard types across Australia. The new Australian Warning System aims to provide consistent warnings to Australian communities so that people know what to do when they see a warning level.

Ms Reegan Key, Manager Operational Communications at Emergency Management Victoria, said the new system would keep communities safe and informed during emergencies.

"Having consistent icons across borders this summer will make it much easier for the community to quickly

understand what's happening and the risk involved. The colours have been chosen to best reflect an escalating emergency, based on strong community testing and accessibility standards," she said.

The launch of the Australian Warning System aligns with the 2020 Royal Commission into National Natural Disaster Arrangements recommendation to "urgently deliver and implement the all-hazard Australian Warning System" across states and territories. Hazards are not bound by borders and the new system reflects this. The system will bring clarity and consistency for border communities and at times when the Australian population is more mobile—such as summer holidays, which overlap with Australia's severe weather season.

Having an all-hazards and nationally consistent warnings system also supports the community to make plans and take action for a variety of scenarios, explained Ms Key.

Above: An example of the Australian Warning System icons on a map. The new icons will be implemented on emergency service agencies' websites and apps.

## The Australian Warning System

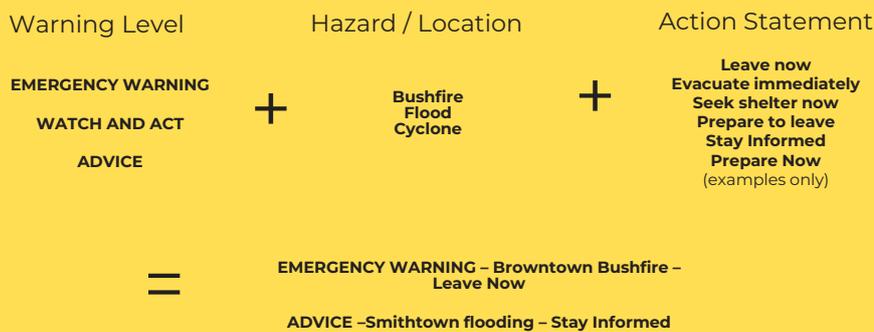
The Australian Warning System has been developed based on community research and input from Australia's emergency services and hazard agencies.

As part of a major national research project, more than 14,000 people were surveyed or interviewed, to assess community perceptions of existing warning systems and improvements which could make warnings clearer and lead people to take action during hazard events.

The system builds on existing warning frameworks and would apply to bushfire, flood, severe storm, cyclone and extreme heat – but is designed to be adaptable and scalable to other hazards.

### A nested model: Three levels of warnings with action statements

Names of levels have been optimised through research, and it is proposed to combine these with a set of action statements, to give the community clearer advice about what to do



### A consistent set of hazard icons for each level

Adopting a consistent shape and colour scheme, with icons increasing in size as the warning level increases



Using the outcomes of community research, a consistent set of hazard icons has been developed for the five hazards:

- Triangle shape with sharp corners
- Yellow, orange, red colour palette
- Icon size or type increasing as warning level increases
- Reduced Threat option to inform community that it is safe to resume normal activities

**Left:**  
Public information and warnings play a critical role in keeping communities safe during emergencies. The Australian Warning System is creating consistency across states and territories.

“The consistent three levels support the community to understand the actions required at each level—regardless of the emergency type,” she said. “Going forward, this will help them to plan what their own response might be to the range of emergencies, with the warning levels and calls to action as clear triggers to make quick decisions.”

The adoption of the Australian Warning System will provide consistency across jurisdictions, but there will need to be a period of adjustment for communities to familiarise themselves with it. The 2020 Royal Commission into National Natural Disaster Arrangements also recommended that “state and territory governments should ensure that the implementation of the Australian Warning System is accompanied by a carefully developed national education campaign that considers the needs of all Australians”.

Ms Key said this process required a collective effort across all fire and emergency agencies in Australia.

“Understanding that the key strength of the new system is its consistency, we’re working together across the country to implement the icon changes this summer,” she said. “The changes to the level names and calls to action will be a focus in 2021, and a coordinated approach to these changes is critical to avoid confusion.”

Amanda Leck, Executive Director of the Australian Institute for Disaster Resilience, said that hazard management agencies across the country were working collaboratively through the AFAC Warnings Group to implement the new system.

“For some agencies, jurisdictions and hazards, the changes to the new warning system have been relatively minimal,” Ms Leck said. “For bushfires, a three-level warning system has been in place in all states and territories since the national agreement in September 2009. Changes have still been required to hazard icons and colours in many states and territories, but the terms ‘Advice, Watch, and Act’ and ‘Emergency Warning’ are increasingly well known by communities.”

“However, for other hazards such as floods, cyclones, severe storms and heatwaves, the new Australian Warning System will require significantly more work to implement, including creating operational systems to support the new system and training staff and volunteers.”

“Through the AFAC Warnings Group, we hope to be able to implement a national community education and awareness campaign to support the roll out of the Australian Warning System,” Ms Leck said.

Federal Minister for Emergency Management David Littleproud welcomed the new Australian Warning System in a statement.

“This new system will make it easier for people to recognise and understand emergency warnings wherever they are in Australia,” he said.

“The Australian Warning System is one tool in the suite of emergency warning mechanisms that state and territory emergency service organisations have at their disposal, and I commend AFAC for its development.” ■

**To see the Australian Warning System, visit <https://knowledge.aidr.org.au/resources/australian-warning-system>.**

## MULTI HAZARD WARNINGS SOCIAL RESEARCH FINDINGS

Throughout all stages of the research it has been observed that existing warning systems in Australia:

- ◆ have limited awareness and comprehension of desired behaviours for each warning; and
- ◆ do not promote the desired responsive actions once a warning has been received (e.g. just 35% of those who received a flood warning consequently took responsive action/s).

There is strong empirical evidence nationally to support the development of a visually optimised three-tiered warnings system. Where a nationally consistent warnings system is developed, this will positively impact awareness, comprehension and ultimately behaviour – notably as current jurisdictional systems do not promote widespread, positive behavioural outcomes.

*Executive Summary, Multi Hazard Warnings Social Research, Metrix, July 2019.*



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# PRODUCT CONFORMITY — IS CONFIDENCE BUILDING?

Concerns about building safety and compliance are driving ongoing regulatory reform initiatives across Australia. The key concern is the need for customers to have confidence in the services and products intended to make their buildings safe. We asked Matthew Wright, Business Development Manager, Australasia, for global safety science company UL about the future of community safety and product conformity.

BY **NATHAN SEMOS**

FPA Australia

**Nathan Semos (NS)** – Hi Matthew, thanks for coming.

**Matthew Wright (MW)** – Thanks, Nathan, it's a pleasure to be here.

**NS** – You're well known to us for your role as FPA Australia's former GM Technical Services/Deputy CEO, and you were closely involved in rolling out practitioner accreditation. What's the relationship with product conformity?

**MW** – Well, there are some parallels. Firstly, like practitioners, many products can demonstrate regulatory compliance or performance, but suffer in a market where good products may be hard to

distinguish from not-so-good ones. Secondly, assessments of practitioner competency have long been rather subjective, placing a lot of liability on individuals whose credentials might lack independent third-party review. In the product sector, this manifests as a perceived equivalence between evidence of suitability options even though the rigour of assessment is vastly different, increasing liability for the person making the selection. With little consistency, people tend to stick to what they're comfortable with, based on experience, without really unpacking the details to make a more informed choice. Lastly, product conformity is the foundation of achieving compliant outcomes for the construction project at large. The highest form of demonstrable practitioner competency and processes cannot prevent problems with building safety if the products selected at design, installation and approval stages are incapable of performing as required during the life cycle of the building. Practitioners, therefore, have a vested interest in the ability of products to deliver regulatory, contractual and consumer/community safety expectations.

**NS** – You mentioned there is perceived equivalence between evidence of suitability options. Why do you think this is the case?

**MW** – In the construction industry, the number of options and their requirements for demonstrating evidence of suitability fall within the scope of the Building Code of Australia (BCA) volumes of the National Construction Code (NCC), but they have been largely static.

The NCC presents six different options, as well as additional requirements regarding fire resistance of building elements and fire hazard properties. These options vary from product certification and product testing performed by independently accredited bodies with multiple decision-makers, through to the opinion of a single engineer or other qualified person. Also allowed is the well-intentioned, but prone to abuse "any other form of documentary evidence", or the opportunity to accept a Certificate of Accreditation from a state or territory that may employ varying processes for assessing product performance.

While the spectrum is very broad, these options are not related to the risk of product failure and consequences of this (unlike the Plumbing Code of Australia (PCA) for plumbing products). Instead, they are presented as equivalent, giving practitioners flexibility to choose the solution they think suits the risk or circumstance. So, it provides maximum flexibility but inadvertently also creates a platform that doesn't always support best practice, and arguably only regulates low risk. In other words, manufacturers who invest in demonstrating their product's capability through an independent, reliable process are competing against those who haven't gone to the same effort. This is the result of two key factors. Firstly, these provisions of the BCA remain somewhat of an amalgamation of the individual state and territory requirements that existed before its development in the late 1980s. Secondly, Australia's commitment to the World Trade Organization Agreement

on reducing technical barriers to trade encourages more flexibility in trade. But free trade shouldn't mean having to accept products that can't achieve local expectations for performance. Industry is seeking greater confidence in this, now more than ever.

**NS** – Okay, so what do you think is changing? Has increased attention had an impact yet?

**MW** – Well there's certainly been attention. Multiple industry bodies have released reports highlighting concerns they have regarding safety, practitioner confusion, and the lack of an even playing field for manufacturers. These concerns existed before high-profile events like the Lacrosse façade fire or Opal tower structural concerns that drew renewed public and political attention to building safety.

Both Australia's Shergold-Weir *Building Confidence* report and Dame Judith Hackitt's *Building Safer Buildings* report into the health of the UK regulatory framework following the Grenfell fire note the problems of product conformity. The Senate Inquiry into Nonconforming Building Products also made a host of recommendations to deliver a more "coherent and robust regulatory regime" regarding products.

These reports each recognised that, if not addressed, poor compliance could undermine the whole system.

However, regulators can be slow to respond, so manufacturers, mindful of brand integrity and trust, are voluntarily searching for ways to differentiate their products from competitors. And as acknowledged by Shergold and Weir,

governments cannot do this alone; the industry also has to rise to the occasion.

The issue has gained momentum from a competitive market viewpoint as well as [in relation to] acceptance expectations. For example, manufacturers and practitioners involved in the selection and installation of products are facing more questions than ever before about whether their products are fit-for-purpose and will conform. This has been driven by factors such as jurisdictions increasing mandatory inspection requirements for passive fire safety installations.

In addition, the extent of non-conforming or non-compliant external cladding material being discovered on buildings has been the proverbial canary in the coal mine. Queensland's Non-Conforming Building Product laws sought to tackle this issue by increasing investigative powers and introducing provisions to require remedial action onsite, disciplinary action or prosecution. This has focused the awareness of insurers and investors, who respond to increased risk in ways that have economic consequences, [not just those relating to] safety.

Vigilance regarding product compliance is increasing and is raising questions that deserve confident answers.

**NS** – Given these challenges, what can Australia learn from other regions and what industry behaviours might we still need to reconsider?

**MW** – Education and information to improve understanding can help to shift local expectations for product

acceptance. There are markets in Europe, North America and Asia that have comprehensive requirements to demonstrate ongoing product conformity. On the surface, you might think that this could restrict trade or stifle innovation, but most of these requirements have actually been implemented to support these objectives.

Appropriate rigour in product conformance assessment increases confidence. Without it, Australia could become [a] dumping ground for products that don't meet the expectations of other markets.

So, practitioners should understand what they're getting with our current evidence of suitability options:

1. An opinion from a professional engineer or other appropriately qualified person is subjective, and could be based on a wide variety of information.
2. Product accreditation by states and territories, where there is no consistent published framework informing decision-making, can equally be subjective.
3. Testing is a valuable part of product evaluation, especially when conducted by an independently accredited laboratory. But such tests only reflect the conformance of a product at a single point of time (during the test). Testing alone doesn't address whether the production of the product after the test will continue to achieve expected conformity.
4. Product certification by independently accredited



certification bodies can complement testing with production surveillance. This provides confidence that the ongoing manufactured product will deliver the same performance as the tested sample. Globally, in many product surveillance schemes the certification body will issue a licence authorising the manufacturer to mark products with the certification. This improves traceability and aids in preventing counterfeiting.

5. Another hallmark of product certification schemes beyond testing alone is that they are often supported by a publicly searchable directory to allow transparent confirmation of products that have satisfied requirements.
6. The inclusion of requirements for product surveillance, testing, marking and providing a directory of certified products can vary between product certification schemes. Ultimately, product certification provides confidence beyond all other evidence of suitability options.
7. "Any other form of evidence" could include elements of all the points above or none. The detail is important.

**NS** – I'm intrigued though about what you mentioned about product surveillance. This isn't something we've necessarily been used to in the local fire protection industry, is it?

**MW** – The concept of product surveillance is well recognised internationally.

The International Organization for Standardization (ISO) and the International Electrotechnical

Commission (IEC) published a joint International Standard that identifies the role product surveillance plays in product certification schemes. Under ISO/IEC 17067, product surveillance can include activities like testing or inspecting samples from the open market or factory, assessing the production process or delivery service, or more detailed production management system audits combined with ongoing or random tests or inspections. This is quite different to simply providing a list of products that have passed a test.

Some fire protection products in Australia are supported by product certification that includes production surveillance, such as fire sprinklers, products associated with special hazard systems, and some smoke alarm and detection products. Typically, this has been because some local regulatory requirements accept international product certifications that already incorporate surveillance for these products, like the UL Mark from the United States. In other cases, it's because manufacturers have voluntarily sought to invest in a process that increases confidence in their product's performance.

**NS** – Final question. We've covered a range of issues today highlighting some key aspects to contemplate as the industry evolves to respond to new expectations. What does good practice look like and how can we continue to build confidence in product compliance?

**MW** – Good practice regarding product

compliance can be demonstrated by providing and accepting evidence of product performance that:

1. has been prepared independently by a body appropriately accredited as competent to evaluate product performance using a prescribed process
2. incorporates testing of the product, evaluation of its construction, and production surveillance to confirm production continues to achieve the performance demonstrated in initial testing
3. is verifiable by a documentation trail that links the physical product to points 1 and 2 and clearly identifies any limitations associated with product installation to achieve compliance.

Achieving these goals doesn't mean we have to abandon all flexibility for product acceptance, but it does mean we are honest about any gaps in our current approach.

Confidence is building as stakeholders modify their approach to meet expectations. Leaders are responding to raise the bar and their collective support will deliver change and improve trust. ■

**UL is developing its UL-AU Mark certification scheme to meet local requirements.**

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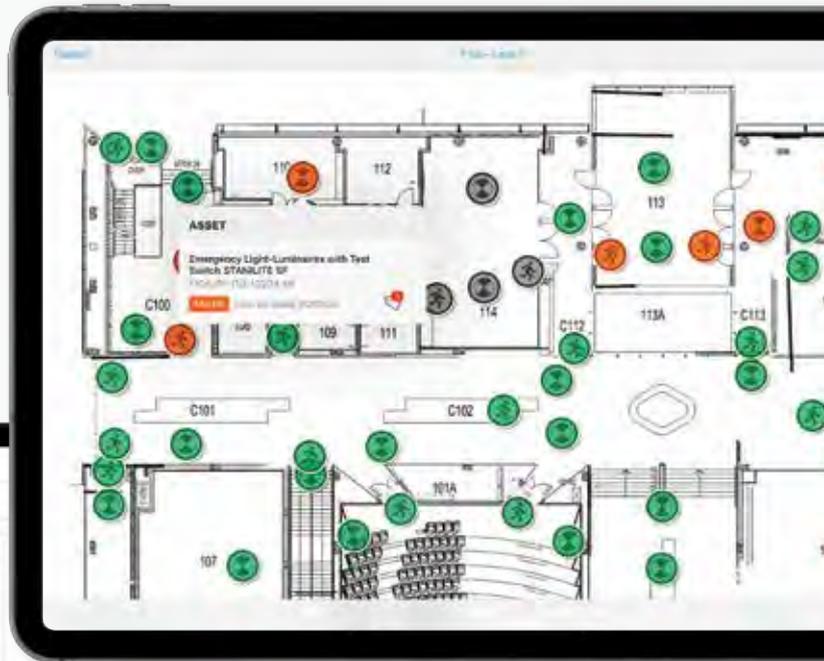
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# CREATING A COMMUNITY THAT IS ANIMAL-READY DURING EMERGENCIES

During a disaster, animal owners are responsible for their animals—whether it be one cat or hundreds of cattle. By focusing on the crucial role of communities in animal emergency management, research is helping people to protect and manage their animals more effectively during bushfires, floods and storms.

BY **BETHANY PATCH**

Bushfire and Natural Hazards CRC

**W**hen an emergency hits, there are two broad groups of the community who need to respond—people without animals and people with animals, whether that be cats, dogs, chickens, horses or livestock. With 62% of Australian households in this second category, animals will affect many people's decision-making and behaviour.

New research is guiding the development of new community groups—called Animal Ready Communities (ARCs)—for hazard-prone communities, which are helping to increase animal awareness and preparedness, build resilience, and change the way animal owners in Australia plan for emergencies.

The groups are backed by Bushfire and Natural Hazards CRC research. In an Australian first, the CRC's *Managing animals in disasters* project has worked closely with communities to create the new groups. These groups foster closer bonds between animal owners and emergency services—a critical piece of the puzzle.

Led by Associate Professor Mel Taylor, an occupational psychologist at Macquarie University, the CRC research team worked with a community-led group in the Blue Mountains region of New South Wales, called Blue ARC. The researchers' experiences with Blue

ARC, the first group of its kind, are now being used to create other ARCs across Australia, helping communities become animal-ready during natural hazards.

"People feel responsible for their animals. They understand the vulnerability of their animals in natural hazard emergencies and want to plan for them," Associate Professor Taylor said.

"Networks are essential. While academics aren't the drivers, we can be the glue."

Australia's National Strategy for Disaster Resilience states that communities should be empowered to share responsibility for disaster resilience. Since the 2009 Black Saturday bushfires there has been an increasing push to enable communities to provide support for locals before and during natural hazards. Animals provide another great opportunity to connect communities and help community members work together in disaster preparedness and planning.

The Blue Mountains area in NSW is regarded as one of the most bushfire-prone in the world and so was an ideal candidate for the development of the first ARC. In October 2013, the area experienced its worst bushfires in more than 30 years, with fires burning more than 118,000 hectares and destroying 200 homes. Only six years later, during the spring and summer of 2019–20, more than 80% of the Blue Mountains World Heritage area was

burnt by more bushfires, devastating the landscape and its wildlife and uprooting communities once more.

Research about bushfires in this area has identified the impact pets and other animals had on owner behaviour, such as delaying evacuation or failing to evacuate. As such, one of the main aims of the Blue ARC group was to work directly with the community, beginning a dialogue with emergency services and supporting agencies to address local barriers to preparedness and planning for animals. The Blue ARC group now actively supports community resilience in emergency events through better awareness, preparedness, planning and response for companion animals, livestock and native wildlife.

Several NSW Rural Fire Service brigades across the Blue Mountains are using the resources developed by Blue ARC, as well as by the Springwood Neighbourhood Centre and the Mountains Community Resource Network.

To enable the development of ARCs in other communities, the researchers contributed to a NSW SES-led project called 'Ohana'. This involved producing a new website called Get Ready Animals ([www.ses.nsw.gov.au/get-ready-animals](http://www.ses.nsw.gov.au/get-ready-animals)), which was launched in August 2020 and funded by the NSW Office of Emergency Management.

The site—a one-stop shop for managing animals during disasters—explains that an ARC is a group of like-



PHOTO: WARREN TURNER, NSW SES

mindful people or groups of people who come together to promote emergency planning and preparedness for animals. Key to this process is identifying people, resources and safe locations; developing and practising local plans; and working with local emergency services, agencies and councils to build community capability and support resilience. It includes a guide called *How to Build an Animal Ready Community*, which distils much of the research Associate Professor Taylor's team completed into an accessible ARC-building template that other communities can use to improve their animal emergency management.

These resources have since been used and expanded in the creation of a new Hawkesbury–Nepean Valley ARC in NSW, which has a greater focus on flood emergencies and large animal ownership. The Hawkesbury–Nepean Valley ARC was led by Infrastructure NSW and undertaken as part of the Hawkesbury–Nepean Floodplain Strategy.

Also included on the Get Ready Animals site are guides on how to bring community groups together around key animal-related concerns, as well as animal emergency plans, checklists for grab-and-go bags for pets, and resources to help care for wildlife affected by disasters. There is also much more information and many other resources and plans.

NSW SES Commissioner Carlene York applauded the site when it was

awarded the NSW Resilient Australia Award in 2020. Commissioner York encouraged animal owners to use the resources it provides to ensure their readiness should a disaster hit.

"There are many resources available through the website including *How to Build an Animal Ready Community*, which is a great guide to help communities and animal groups become more prepared and self-reliant," she said.

In addition to the Get Ready Animals website, Associate Professor Taylor's research has recently contributed to two booklets to help people in the Hawkesbury–Nepean Valley and the Blue Mountains prepare themselves and their animals for an emergency. The *Keeping Your Animals Safe in an Emergency* booklets were codeveloped with key organisations within each community, with input from NSW SES, NSW DPI, Infrastructure NSW, Greater Sydney Local Land Services, Hawkesbury City Council, and NSW RFS, as well as Blue ARC, the Mountains Community Resource Network and Agnes Banks Equine Clinic.

Projects such as this one, with an Australia-centric and community-focused approach, are helping to change the traditional mentality of emergency management, which has been seen solely as a 'people' issue. As Commissioner York noted, "We need to make sure our communities are not only prepared themselves, but are preparing for their animals as well."

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**"People feel responsible for their animals. They understand the vulnerability of their animals in natural hazard emergencies and want to plan for them."**

Associate Professor Mel Taylor,  
Macquarie University

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By highlighting the impact of animals on people's behaviours in natural emergencies, this project has reinforced the need to support communities to be prepared and to plan for animals – and helped create the conditions for achieving this.

"We have sought to assist in the national dialogue and the production of plans and community engagement materials to support shared responsibility with communities in this area," Associate Professor Taylor said. ■

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***Keeping Your Animals Safe in an Emergency* booklets and more information about Associate Professor Taylor's work are available on the CRC's website: <https://www.bnhcrc.com.au/research/animalsindisasters>.**

NSW SES launched its new evidence-based Get Ready Animals website in August 2020.

The current fire danger rating system. The new system will be simpler, have fewer levels, use logical colours and simpler terms.



# THE NEW AUSTRALIAN FIRE DANGER RATING SYSTEM

BY **WAYNE KINGTON**  
**AFDRS PROGRAM, AFAC**

**F**ire danger ratings are a shorthand way of describing the potential level of danger from bushfires. Ratings are used in many parts of the world and are especially important in the Australian context due to the prevalence of flammable vegetation and hot and dry conditions.

The Australian landscape has evolved with fire, which is a natural part of many ecosystems. However, under certain conditions these environments are dangerous to communities, infrastructure, property, ecosystems and populations of species. This creates considerable challenges for public and private land managers, the emergency services and the community at large,

The way that fire danger is forecast is undergoing significant changes, bringing a range of benefits to Australians for decades to come.



PHOTO: KEITH PAKENHAM, CFA

which were tragically highlighted in the Black Summer bushfires of 2019–20. The recent Royal Commission into National Natural Disaster Arrangements Report stated:

*During natural disasters the public has an urgent and vital need for emergency information and warnings to ensure they are able to make safe decisions. They need to know what is likely to happen (or has happened), what to do and what to expect.*

The Australian Fire Danger Rating System (AFDRS) program is redesigning the forecasting of fire danger, bringing substantial improvements by using up-to-date science and technology, introducing greater national consistency and improving how fire danger is communicated to the public.

This work is well advanced, with the science build being tested, implementation plans finalised and public-facing components being designed. With roll-out of the AFDRS planned to begin in 2022, this article looks at how it will improve the provision of information to government agencies, industry and the public, and the benefits this will bring.

The current Fire Danger Rating System is largely based on science that is more than 60 years old, but new research has greatly improved our ability to accurately predict fire behaviour and the potential threat to the community. The AFDRS uses the latest scientific understanding about weather, fuel and how fire behaves in different types of vegetation to improve the reliability of fire danger forecasts. It provides more accurate fire danger predictions at a finer resolution than previously available. It also provides richer data and decision-making tools to land and fire management agencies. This will enable government agencies to prepare staff and resources for firefighting more effectively and to know when to be at a high state of readiness to fight fires. Further, it will support better decisions for prescribed burning and fire suppression. The improvements will give government agencies, industry and the community increased confidence to act on the fire danger information they receive.

The AFDRS will help fire agencies provide advice to the community that is more accurate, timely and specific. The costs of bushfires in Australia are enormous – the provision of more accurate fire danger information is expected to lead to better decisions and therefore to maximise the efficient use of resources, delivering significant savings. This includes decisions and actions to improve proactive bushfire management and to prevent the loss of life, property, community infrastructure and businesses, reducing the cost of fire disasters.

Following community feedback about the existing fire danger rating system gathered from social research, the new fire danger rating system will be simpler, have fewer levels, use logical colours and use simple terms to improve the way the system is understood and used. It will make information presented to the community consistent across

**During natural disasters the public has an urgent and vital need for emergency information and warnings to ensure they are able to make safe decisions. They need to know what is likely to happen (or has happened), what to do and what to expect.**

every state and territory in Australia, with each fire danger rating coming with a clear recommendation about appropriate action to take to reduce personal risk and exposure to bushfire. Messaging can also be tailored to specific vulnerable groups. It is expected that these improvements will lead to a more prepared and resilient community.

The AFDRS features a collaborative approach led by the jurisdictions coming together with a commitment to building a nationally consistent system that is flexible enough to meet local needs. A nationally consistent system will support cost-effective system updates, provide consistent messaging along state and territory borders, improve use for travellers and have lower system development costs. Greater cross-border operability supports the sharing of firefighting resources and a more focused approach to reducing the size, intensity and impact of fires. The AFDRS software build is designed to be continuously updated to take advantage of improving science and data.

The AFDRS is a collaborative project of national significance and will bring benefits to Australians for generations to come. ■

**For more information about the AFDRS, visit the website at [www.afac.com.au/initiative/afdrs](http://www.afac.com.au/initiative/afdrs)**

**Above: The current fire rating system (pictured above) is based on science that more than 60 years old.**

PHOTO: QFES



# AN ORIGAMI-INSPIRED FIRE SHELTER

The combination of fire-resistant materials and the centuries-old practice of origami may protect people during a bushfire emergency.

BY **RICKY W K CHAN**

School of Engineering, RMIT University

The south-east of Australia is known to be one of the most hazardous bushfire regions in the world. The volatile mix of climate, geography and vegetation can easily lead to bushfires, and CSIRO research indicates that the increasingly warmer and drier climate caused by climate change will make them more prevalent.

During a bushfire, heat transfer occurs by a combination of convection (movements of hot air mass),

conduction (heat travelling through material), and radiation (a form of electromagnetic wave). Of the three, radiation, which is measured in heat flux (in  $\text{kW}/\text{m}^2$ ), does not require a medium to transfer. It is the most dangerous aspect of a bushfire—research indicates that an unprotected person may feel pain at 140 metres from flames after one minute of exposure. At 55 m, the heat flux is fatal after a few minutes.

The best protection from radiant heat is distance. When that is not an option, a protective barrier will become the difference between life and death. When battling wildfires, US firefighters carry a lightweight fire shelter they can deploy when needed. It is designed to reflect radiant heat and trap breathable air, but cannot withstand sustained contact with flames.

To overcome this, researchers at RMIT University have developed a protection system that can be used in an emergency. It is a fire-rated blanket that deploys like an origami-type structure that encloses a person on the ground. When it is not in use, it can be folded into a small bag that can be carried by hand. The research team at RMIT University is attempting to optimise the fire shelter to:

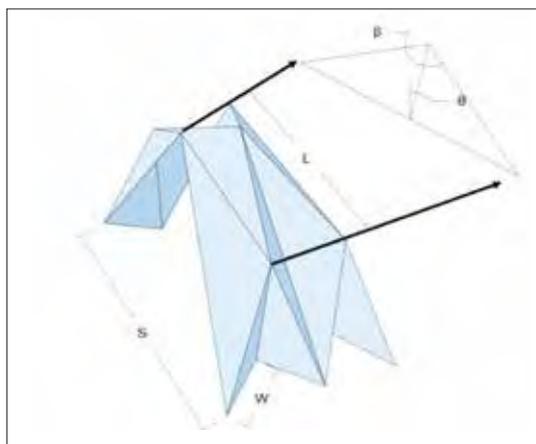
1. facilitate deployment and enclosure of a person
2. increase stiffness of a fire-rated fabric to create creases
3. meet Australian Standards fire tests.

## Origami structures

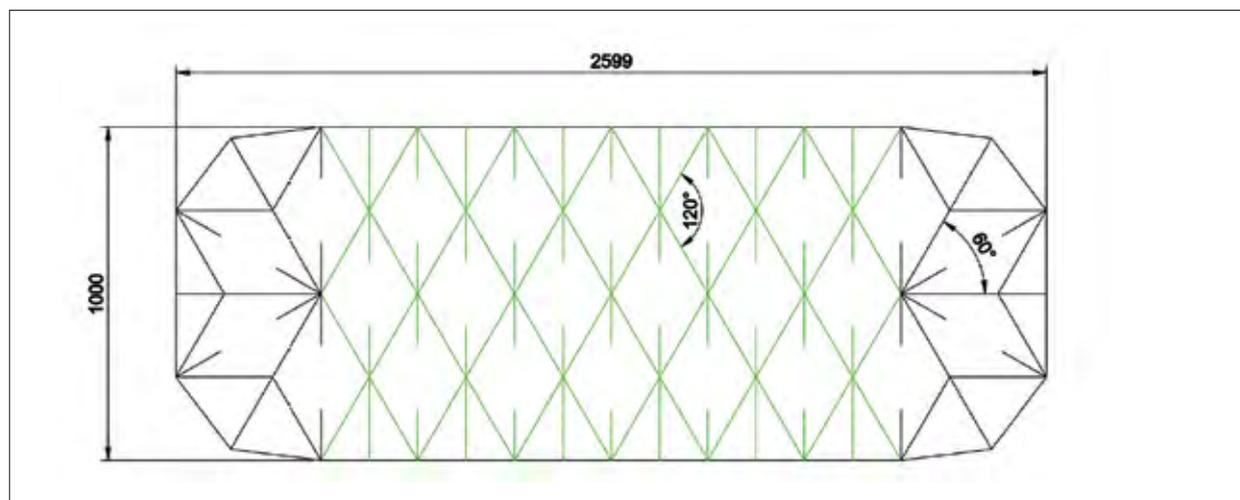
The word 'origami' comes from the Japanese 'oru' and 'kami', meaning 'to fold' and 'paper' respectively. It is a recreational art and involves folding a sheet of paper into shapes resembling objects and animals. Origami has become very complex, with some creations even involving kinetic movements. The fascinating shapes of origami have inspired artists, mathematicians, architects and engineers, and have often been applied in spatial design, robotics and medical devices.

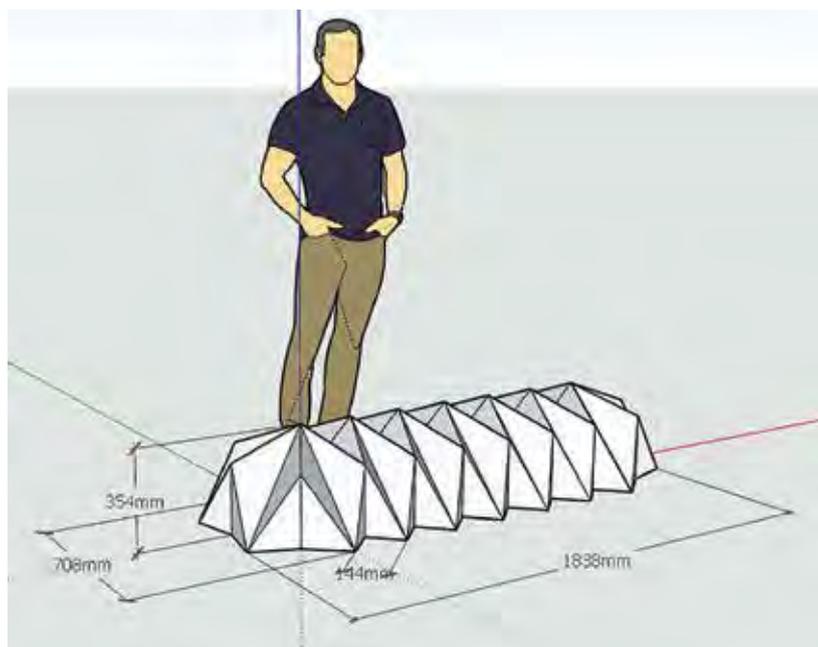
The fire shelter presented in this article is inspired by the Yoshimura crease pattern (Miura & Tachi, 2010). The geometry consists of repetitive pairs of triangles that form a diamond shape. By alternating 'mountain' and 'valley' folds, the Yoshimura crease pattern may collapse ('buckle', in engineering terms) when compressed (Hunt & Ario, 2005) and extend under tension. The basic pattern is illustrated in Figure 1. The geometry is characterised by the apex angle ( $b$ ), deployment angle ( $q$ ), length

**FIGURE 1.** Yoshimura crease pattern.

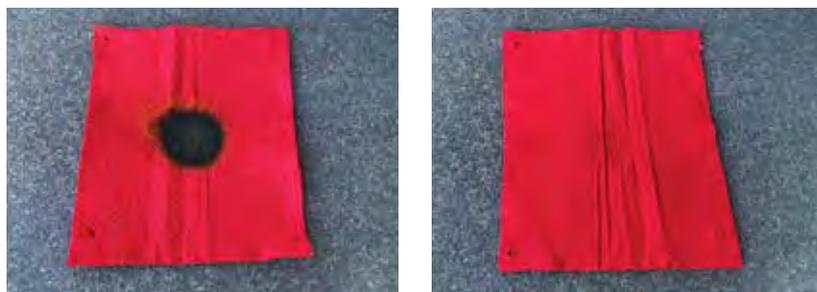


**FIGURE 2.** Lay-flat geometry of the origami fire shelter.

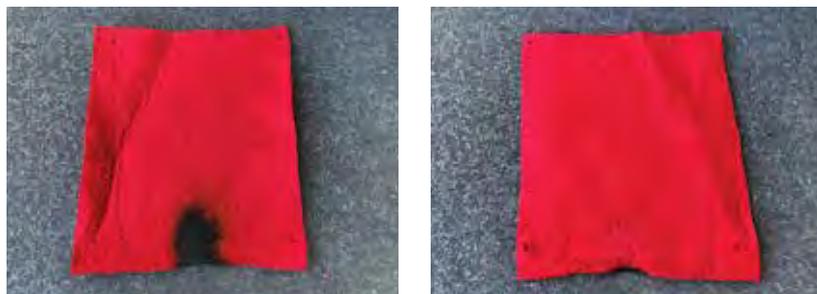




**FIGURE 3.** 3D representation of the origami fire shelter.



**FIGURE 5.** Sample C after procedure A: front (left) and back (right).



**FIGURE 6.** Sample C after procedure B: front (left) and back (right).

(L), span (S) and width (W). These parameters are related geometrically.

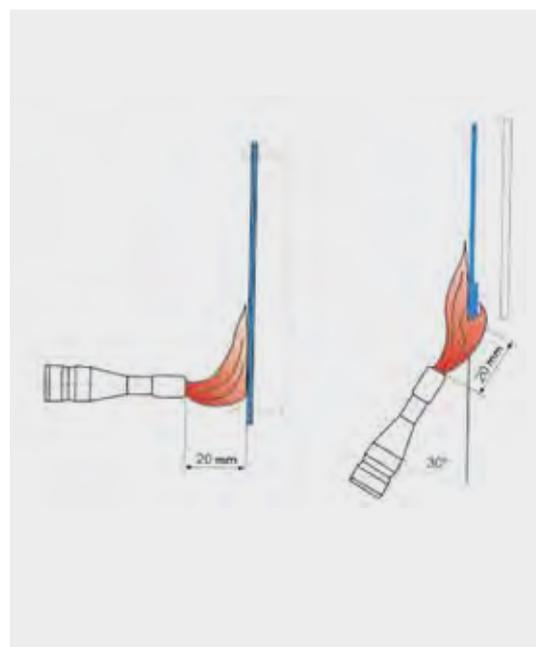
Researchers at RMIT University used the Yoshimura crease pattern to design a shelter that encloses a person lying on the ground. The lay-flat geometry is shown in Figure 2 and a three-dimensional representation is in Figure 3.

### Selection of fire-rated fabric

The fabrication of the fire shelter began with selecting suitable fire-rated fabric. Three burn-over fire blankets (samples A, B and C) were sourced from the Australian market for evaluation. Fire tests were conducted at RMIT University in accordance with AS 4967:2019

Protective clothing for firefighters (AS 4967, 2019). AS 4967 refers to clauses in procedures A and B in ISO 15025:2016 (ISO 15025, 2016).

These tests aim to verify a fabric's ability to protect a person against fire and limit fire spread. Specimens measuring 200 x 160 millimetres were cut from the blankets and secured on a metal frame. They were subjected to direct flame positioned 20 mm away for 10 seconds. The flame was produced by commercial grade propane, as shown in Figure 4. One of the three samples did not pass the fire test. Specimens from Sample C at the end of the fire tests are shown in Figures 5 and 6.



**FIGURE 4.** Procedure A (left) and procedure B (right) to ISO 15025: 2016.

### Fabrication of the shelter

Thickness and texture were compared and Sample C was selected as the base material for the fabrication of an origami fire shelter. However, the original fabric was soft and lacked the stiffness required to create creases. Several strategies to overcome this were tried, including inserting steel wires and sewing on thin pieces of plastic sheets. Eventually, heat-stabilised interfacing fabric was found to produce satisfactory results. Three layers of such interfacing materials were attached, with the middle layers corresponding to the triangular shapes shown in Figure 2. Since the interfacing fabric was not fire-rated, fire tests were repeated, and showed that the fire blanket material had sufficient thickness to prevent the interfacing material from melting. The final prototype, shown in Figure 7(a)–(c), can be folded and stored in a small bag for easy transportation. It is self-supporting and easy to deploy, and encloses a person lying on the ground. In total, the shelter (excluding the carry bag) weighed 2.2kg.

### Conclusion and future works

Origami produces many artistically pleasing and fascinating structures and has inspired many practical applications. The origami-inspired fire shelter developed by a team of researchers at RMIT University makes use of the Yoshimura crease pattern to create a collapsible shelter by alternating 'mountain' and 'valley' triangular folds and using a commercially available fire blanket. Compared with existing fire

**FIGURE 7.** Origami fire shelter (a) stored;(b) collapsed.



**FIGURE 7.** (c) deployed.



**NOTE:** Australian and New Zealand fire services do not use personal fire shelters for wildfire fighter survival. The need for fire shelters is greatly reduced and firefighter safety is increased if training and incident management is focused on avoiding entrapment situations in the first instance.

shelters, the origami fire shelter:

- ◆ can be deployed rapidly
- ◆ will entrap more breathable air for the occupant
- ◆ will sustain direct contact with flames.

Research is ongoing and will evaluate the temperature inside the shelter when it is engulfed in flame and seek to reduce its overall weight and enhance its portability. ■

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# Practising diversity and inclusion in emergency management

The practice of diversity and inclusion within emergency services agencies is lacking, and the benefits it provides are not well understood. How do we effectively implement diversity and inclusion policies in emergency management practices?

BY **RADHIYA FANHAM**

Bushfire and Natural Hazards CRC

**B**uilding a diverse and inclusive workforce in emergency management is not just about drawing in people from different backgrounds to work and volunteer. It is also about bringing together different ways of thinking and approaching problems, which can lead to innovative solutions while better representing the communities emergency services serve, now and in the future.

The challenge is to unlock the full benefits that come from developing diverse and inclusive workforces, or the potential opportunities from interactions with increasingly diverse communities.

"Diversity and inclusion skills are generally not rewarded or valued in emergency management organisations in the same way more conventional technical skills are," said Ms Celeste Young, Bushfire and Natural Hazards

CRC researcher and Collaborative Research Fellow at Victoria University's Institute of Strategic Economic Studies.

"This is due to a lack of clarity as to what diversity and inclusion actually are and do."

As such, one of the key questions being asked by the sector is: how do we effectively implement diversity and inclusion policies in emergency management practices? This was the focus of the *Diversity and inclusion: from policy to practice* online forum, hosted by the Bushfire and Natural Hazards CRC in collaboration with Women and Firefighting Australasia (WAFA), Victoria University, Queensland Fire and Emergency Services (QFES), and Fire and Emergency New Zealand (FENZ) in December 2020.

With more than 150 people in virtual attendance, the forum presented the *Diversity and inclusion framework for emergency management policy and practice*. The Framework,

developed through the CRC's *Diversity and inclusion: building strength and capability* project, is designed to provide a basis for practitioners to address diversity and inclusion issues through a strength-based approach, which builds upon current practice and expertise in the sector.

The CRC's *Diversity and inclusion* project, which began in July 2017, set out to understand what effective diversity and inclusion is and how this can be measured. The research team, co-led by Ms Young, aimed to identify where effective diversity and inclusion is occurring within organisations, the characteristics of diversity and inclusion, and how it can be implemented and measured at an organisational level.

"The project's key purpose has been to develop an evidence-based diversity and inclusion framework to support better measurement and management practice," Ms Young said in a September 2020 blog post.

Above: Rural and urban female volunteers at Fire and Emergency New Zealand.



PHOTO: WAFA

Above: WAFA conferences including HOT (Hands on Training) Days allow women from different fields and services throughout Australasia to be exposed to different training ideas and equipment.

Diversity in the emergency management sector encompasses gender, race, disability, religion and culture. There are currently low rates of participation for women and those from diverse cultural backgrounds in many areas of emergency management, which has ramifications for emergency services' capacity to modernise and build future service capability in the face of considerable change and the need to increase resilience.

The research team developed the *Diversity and inclusion framework for emergency management policy and practice*, the *Learning as we go: developing effective inclusive management* support document, and other materials to support practitioners' measurement and management of inclusion in this complex and challenging area.

"The *Diversity and inclusion framework for emergency management policy and practice* uses a strength-based approach, and includes the levels which diversity and inclusion need to be measured and managed; *Statements of Inclusion* as a tool to clarify and assist negotiations between diverse parties; a process for integrating diversity and inclusion through emergency management, organisational planning and risk frameworks; and risk mapping to identify capability and skills needed to assist workforce planning," Ms Young said.

In her presentation for the *Diversity and inclusion: from policy to practice* online forum, Ms Young challenged common assumptions about the value of practitioners' work and how it can enhance service delivery and create safer and more resilient organisations and communities.

"Diversity is what creates the change and inclusion is how you manage it," she said.

"Whenever you put diversity, which is essentially difference, into a system, it creates change. If you want to manage the risk that this creates, inclusion is how you manage this type of risk."

The all-female forum panel went on to discuss the evolution of inclusive practices over the last decade, the purpose of diversity, and the critical role

inclusion plays in the management of social, human and natural hazard risk in communities and organisations. The three panellists also explored what is at risk and explained why diversity and inclusion is an organisational imperative and why investment to build capability in this area is now critical.

Ms Quinn Cramer, QFES Station Officer and WAFA President, described the role WAFA plays in diversity and inclusion by discussing policies and best practice insights, including future directions and opportunities for women in firefighting.

"In 2018, WAFA set out to produce a number of legacy documents that will assist us in measuring and sharing practical solutions for inclusive operations of women going forward," Ms Cramer said.

"One of the documents was a QFES workshop synthesis that was a collaborative piece between Janine Taylor from QFES, WAFA and Celeste Young. This measures traits, values, behaviours and systems that are in place across Australasia, and rates whether they are always, sometimes or never being displayed. It was a promising workshop that showed us that there is a lot of great stuff happening across Australasia and there is capacity to build.

"The other document that we created

**"Diversity is what creates the change and inclusion is how you manage it."**

Ms Celeste Young, Research Fellow, Victoria University

“What we need to remember is, while we’re recruiting for now and what our present needs are, we also need to understand that we are actually recruiting for what our future is going to be like and so we need to know what that looks like.”

Ms Rachael Utumapu, Manager of Women’s Development, FENZ

was the WAFA outcomes statement, a collaborative piece that measured a number of different practical solutions that are available to assist organisations and women in the future to increase inclusivity across the emergency service sector in Australasia.”

The WAFA outcomes statement outlines practical steps for recruitment, leadership and mentoring, and health and well-being. Some of these steps include:

- ◆ reviewing language to ensure it shows respect and representation
- ◆ developing social media policies and presence to recruit women directly and support them as firefighting cadets
- ◆ adopting strategy, policy and practice to reach gender equity in leadership in emergency management services
- ◆ including diverse leadership models in leadership training to ensure there is capacity to address the challenge of contemporary and future emergency management
- ◆ recognising post-traumatic stress, and post-traumatic growth, as unexceptional risks in the work
- ◆ recognising the profound impact harassment and discrimination have on top of the normalised emotional load, and recognising the role of institutional courage in confronting discrimination and harassment and its power to transform organisations
- ◆ addressing the gendered health and well-being of the job, which requires thoughtful consideration for the whole team.

The third panellist in the forum was Ms Rachael Utumapu, Manager of Women’s Development at FENZ. She spoke on encouraging more women to join emergency services agencies in New Zealand and what diversity and inclusion initiatives have already been implemented there. She also spoke about recruitment being viewed in two parts—attracting the right people to an organisation, and knowing who existing members are and what their perception and experience of the organisation is.

“Attracting diversity to the organisation is the first challenge, and the second challenge is ensuring that they have a good experience,” Ms Utumapu said.

“We need to have a good understanding of what our diversity needs actually are. We can talk about race, culture, gender, but diversity of thought is also really important. Diversity is made up of so many parts and you may actually find that your organisation is more diverse than you think, but it’s really important to know who the people in our organisations are to understand what kind of people we need to attract and bring in to reflect our communities.”

Ms Utumapu also outlined FENZ’s journey to creating a positive workplace culture, which considers:

- ◆ behaviours and conduct in the office
- ◆ a shared code of behaviour
- ◆ living values
- ◆ support for all people
- ◆ a bullying and harassment complaints process
- ◆ policies and procedures.

“What we need to remember is, while we’re recruiting for now and what our present needs are, we also need to understand that we are actually recruiting for what our future is going to be like and so we need to know what that looks like,” Ms Utumapu said.

Diversity has untapped benefits not only for emergency management agencies, but also for the broader community. It is important to understand what the value and benefits of effective diversity and inclusion activities are, and where and how these can be quantified.

PHOTO: WAFA



“Over the past three years, the emergency management sector has taken up this challenge [of diversity and inclusion] with government, industry bodies, organisations and researchers working alongside each other to further this agenda,” Ms Young said in her blog.

“As one practitioner commented, it has been a ‘social movement’ which has shifted the focus from categories of difference to how this difference can be effectively included and leveraged to enhance organisations and communities, and to build resilience. This has been welcomed by diversity and inclusion practitioners, but they also know this is an unpredictable process where you need to be prepared to stop and hold the line in the face of adversity.”

The CRC’s *Diversity and inclusion: building strength and capability* project is contributing to diversity conversations across upper levels of the emergency management sector.

“In the same way it takes a whole village to raise a child, it will take everyone in the emergency management system working together for the longer term if the reality of a truly inclusive culture is to be realised,” Ms Young said. ■

To find out more about this research, including the full recording of the online forum and the above-mentioned resources, visit [www.bnhcrc.com.au/events/2020diversityforum](http://www.bnhcrc.com.au/events/2020diversityforum).

Below: WAFA conferences regularly sponsor delegates from Pacific nations to increase opportunities for women across Australasia.

# LEADING CULTURAL CHANGE TO ENHANCE MENTAL HEALTH

Recognising the growing concern about and evidence of well-being issues within Fire and Emergency New Zealand, the agency's Safety, Health and Well-being Team delivered a series of workshops to foster a more psychologically safe workplace, drawing on skills and connections of leaders within their ranks.

BY **ALANA BEITZ**

AFAC

**F**ire and Emergency New Zealand's (FENZ) Psychological Well-being Workshops were recognised by the Stewart & Heaton Leading Practice in Mental Health Award in 2019. The annual award recognises agencies at the forefront of mental health practice and aims to support an industry culture that adopts leading practice and spreads the benefits of innovative well-being initiatives across all first responders in Australasia.

Alison Barnes, Manager of Health, Safety and Well-being at the Civil Aviation Authority New Zealand (previously Safety, Health and Well-being Team Leader at FENZ), explained how the workshops respond to significant changes in the mental health space, including increased call outs to difficult scenes such as suicides.

"Our situation within FENZ was influenced by the changing number and type of medical resuscitation calls that we were going to," she said. "In some parts of the country there were increases in the number of medical calls that people are going to from 38 to over

1,500 per cent in the course of a very short time, over about 18 months."

This was coupled with the introduction of new workplace safety legislation in New Zealand in 2015 that put emphasis on workers' psychological well-being alongside their physical health.

The result was the development and delivery of more than 100 Psychological Well-being Workshops tailored to the needs of 14,000 FENZ staff across 646 workplaces. The workshops focused on empowering leaders within teams to deliver mental health information that was relevant to the real-life experiences of participants.

## Taking an adaptive approach

The FENZ Safety, Health and Well-being Team took an adaptive approach when developing the workshops to ensure the program was constantly reviewed to meet participants' needs.

The project team acknowledged its work was unlike day-to-day operations within the agency.

"We have a fantastic legacy within FENZ of being able to rise to technical challenges, our people are talented and action-oriented—if you present them with

a challenge, they will look at it and find a way to deal with it," Ms Barnes said. "But looking at psychological well-being required a different response, there isn't a one-size-fits-all answer."

Workshops were held with different group sizes and at different durations depending on who was participating. The workshops had to be flexible enough to meet the availability and work experience of all staff—from the rural volunteer cohort to the executive suite.

"Every single workshop was different," Ms Barnes said. "I had to hand things over, hold my vision lightly, and understand this was an adaptive challenge, the vision belonged to everybody who was part of it."

Andy Chappell, Safety, Health and Well-being Team Leader at FENZ, also helped to deliver the workshops across dozens of locations.

"What we've tried to do the whole way through is have a workshop that suits the people we're delivering it to, as opposed to the people delivering it," he explained.

Uniting each workshop was the aim to encourage and normalise having conversations about well-being and seeking early support. All workshops are

based on the principles of psychological first aid and give participants the tools to identify and address mental health issues within themselves and others. The long-term aim for the workshops is gradually to embed a culture of well-being into every training course, review or project that FENZ undertakes.

**Leading the way**

The project team ran training sessions for leaders within FENZ to copresent the workshops to their staff or colleagues. The team identified and trained two different types of leaders for the project—those of ‘position’ as well as those of ‘influence’.

“By position, we’re talking about operational rank, a station officer and above, the people that sit in the front left seat of the trucks and make the decisions on the fire ground,” Mr Chappell said.

“But in our organisation we also looked at the leaders with influence; these are the people that had significant influence or interaction with our people ... So much of your culture changes with the people you relate to side by side, not necessarily just with your seniors.”

This opened up workshop copresenting positions to people with existing rapport and natural connections to their colleagues, including union representatives and peer supports: “They needed to be mana, people with integrity, and people that looked like the people we were delivering to,” Mr Chappell said.

Having the right leaders involved in the workshops encouraged a more open

and honest dialogue, which Mr Chappell said enhanced the experience for all participants.

“Vulnerability can be tough, and certainly we’re a male-dominated organisation and we still have the feeling that if you share your feelings then you’re weak,” he said. “It takes tremendous courage to be vulnerable amongst your peers, and the more people can be vulnerable within the workshops, the more successful they are.”

**See yourself in the solution**

The FENZ Safety, Health and Well-being Team identified one of the key factors of success was ensuring the workshops were delivered by people who look like, or relate to, the participants.

“If I was doing the delivery, I would have somebody who was operational standing alongside me so participants felt that the people talking to them could actually relate to them, and not pretend to understand all aspects of their role,” Ms Barnes said.

The team also sourced real-life scenarios from FENZ staff to apply the psychological first aid principles to during the workshops. Māori and Pacifica models of care were explored, including *Te Whare Tapa Whā*, the four sides of Māori health. Ms Barnes explained the design of the workshops also considered the ‘group photo effect’.

“When you take a group photo, the first thing people do is look for themselves in that photo,” she said. “If they can’t see themselves or somebody who looks like them, they will disengage.



We needed people to see themselves and what they do in this work.”

For best engagement, the Psychological Well-being Workshops need to be delivered *kanohi kit e kanohi*, face to face. Due to COVID-19 restrictions, the project was put on hold for most of 2020. In the future, the project team will continue to evolve its work by expanding its resources to engage a larger number of its 12,000-strong volunteer cohort, and extending psychological well-being and support to families of FENZ staff. ■

**Find out more about the FENZ Positive Workplace Culture program:** <https://positiveworkplace.fireandemergency.nz>.

**Watch the Stewart & Heaton Masterclass webinar on AFAC YouTube channel:** [www.youtube.com/watch?v=Wi8Zuyo\\_nl0](https://www.youtube.com/watch?v=Wi8Zuyo_nl0).

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## Warringtonfire Australia invests in new reaction to fire test equipment



Warringtonfire Australia, part of the Element Group, is announcing its new extended capabilities to conduct crucial reaction to fire testing prescribed by the National Construction Code.

The team at the testing laboratory in Melbourne has been busy installing and commissioning the new equipment for AS 1530.2, AS 1530.3, ISO 1716, AS ISO 9239-1 and ASTM D5630. The testing will commence from January 2021.

The laboratory's new capabilities include:

- AS 1530.2 test for flammability of materials – for sarking materials and drapery.
- AS 1530.3 simultaneous determination of ignitability, flame propagation, heat release and smoke release – for fixed seating, proscenium curtains, insulation, duct work, and other materials.
- ISO 1716 determination of the gross heat of combustion (calorific value) – bomb calorimeter.
- AS ISO 9239-1 determination of the burning behaviour using a radiant heat source – critical radiant flux (CRF) – for floor linings and coverings.
- ASTM D5630 standard test method – for ash content in plastics.

The acquisition of the new equipment complements the laboratory's existing reaction to fire testing capabilities for AS ISO 9705 room burn, AS 5113 facade, AS 3837/ISO 5660-1 cone calorimeter and AS 1530.1 combustibility.

Jason Jeffress, Divisional Director – Australia at Warringtonfire, said: "This new equipment expands our existing reaction to fire testing capabilities, offering a fully comprehensive range of fire testing services in Australia. It also reinforces our position as market leader and most trusted testing partner."



Warringtonfire offers a comprehensive range of independent fire safety services, all with a globally respected mark of quality assurance.

### About Warringtonfire

Warringtonfire, part of the Element Group, specializes in providing a comprehensive range of independent fire testing, assessment, engineering and certification services to international markets from a network of accredited sites across the globe including Europe, the Middle East, Asia and Australia.

[info.fire.melbourne@warringtonfire.com](mailto:info.fire.melbourne@warringtonfire.com)  
+61 3 9767 1000  
[www.warringtonfire.com](http://www.warringtonfire.com)

### About Element

One of the world's leading global providers of testing, inspection and certification services for a diverse range of materials, products and technologies in advanced industrial supply chains where failure is not an option. Headquartered in London, UK, Element's team of more than 6,000 expert scientists, engineers and technicians operate from around 200 locations across five continents, delivering an extensive range of solutions to customers in critical industries including aerospace, connected technologies, construction, defense, energy, environmental, life sciences and transportation.



PHOTO: AFAC

# VIEW FROM THE TOP: LEADING UNDER PRESSURE

The commissioners and chief officers from jurisdictions most affected during the 2019–20 bushfire season shared their insights on leadership and pressure in the 2020 Knowledge Event Series.

BY **ALANA BEITZ**

AFAC

One of the key functions of AFAC is to collaborate and share knowledge. This is the aim of the Knowledge Event Series, held annually across nine locations in Australia and New Zealand, supported by the Motorola Solutions Foundation.

The theme for the 2020 Knowledge Event Series was: 'Leading under

pressure: how our leaders manage themselves and their agencies during intense and sustained operational periods'.

Due to COVID-19 restrictions, the event was held virtually and focused on the experiences of Australian fire agency commissioners and chief officers. AFAC CEO Stuart Ellis remarked that it was a fitting adjustment following the scale and intensity of the Black Summer bushfires in 2019–20.

"Historically we have invited overseas speakers to talk about events and developments across the globe. Of course, that has not been possible in 2020, and so we have looked inward, we have looked to our own chiefs and commissioners, and I'm so glad we have, because we have received insights from four chiefs and commissioners who were heavily impacted by the season just past."

Four chief officers and

Above:  
The NSW  
Rural Fire  
Service  
State Control  
Centre during  
the 2019–20  
bushfire  
response.

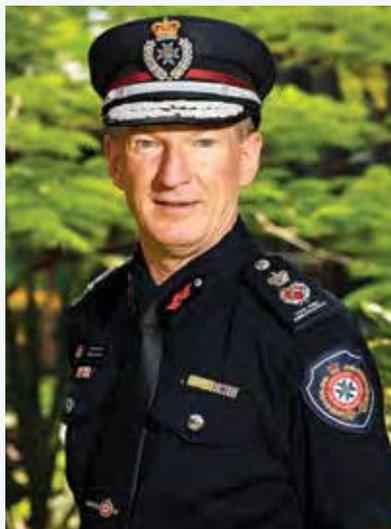
commissioners shared their professional and personal pressures relating to the 2019–20 bushfire season: Queensland Fire and Emergency Services Commissioner Greg Leach; Emergency Management Victoria Commissioner Andrew Crisp APM; South Australian Country Fire Service Chief Officer Mark Jones QFSM; and New South Wales Rural Fire Service Commissioner Rob Rogers.

The Black Summer season has been referred to as unprecedented in many states of Australia. In Queensland, bushfires started to affect communities in August 2019 and culminated in 7.7 million hectares being burned and 49 homes lost. On 3 January 2020, with more than 260 new fires burning, Victoria declared a state of disaster. Many communities became isolated and the fires continued until March. Five people lost their lives and 1.5 million hectares of land were burned. In October 2019, SA was affected by catastrophic fires due to weather conditions, with around 65 new fires starting in one hour. Approximately 10,500 volunteers were active in the state over this time, and on one day, 6,500 firefighters were activated. In NSW, the longevity and scale of the season was devastating, with more than 11,000 fires, 2,500 homes destroyed and 26 lives lost. Across Australia, thousands of interstate and international resources assisted with the fire suppression effort until there was some relief in February 2020.

"These four chiefs were directly impacted—their states were directly impacted—by what has occurred. At times we don't often appreciate the pressures and experiences of our own people, and this provides some really valuable insights, which I'm so glad we have captured after such a significant season," Mr Ellis said.

The observations provided by operational leaders were contextualised with a presentation from University of Tasmania Associate Professor Christine Owen on research regarding pressure and stress management.

Key observations and advice from each of the five presenters in the 2020 Knowledge Event Series have been captured. The event is available to watch in full on the AFAC YouTube channel: <https://youtu.be/xUmz-rm9AbQ>.



### COMMISSIONER GREG LEACH QUEENSLAND FIRE AND EMERGENCY SERVICES

#### On compounding events and fatigue management:

"Our state operations centre has now had over 400 days of continuous operations, so the long-term effects of fatigue coming through a bushfire season, then into a flood season, and then straight into COVID-19 has had quite a significant effect on our resourcing as an organisation, particularly while we are still running business as usual activities as well ... The main consideration for me is that each and every one of our people get to go home safely at the end of their shift, whether they're out on the fire line or working in an incident management centre, or supporting firefighters behind the scenes."

#### On using teamwork to alleviate pressure:

"The good thing about emergency services is that we are surrounded by really good people: set your commander's intent, let them know what you want to do, and they will get on and do it. Have confidence in the training. I think we are very well placed to deal with the challenges that the world throws at us these days. We had a very busy bushfire season, we are now dealing with COVID-19, and we are watching the monsoon season to see what cyclone behaviour looks like in 2021. We are prepared for that, our people are prepared for that, and we will do what we can to support the communities of Queensland."



### COMMISSIONER ANDREW CRISP APM – EMERGENCY MANAGEMENT VICTORIA

#### On what creates pressure for leaders:

"Who would not have been concerned about 4,000 people on the foreshore of Mallacoota as the fire was going into that town? These are the moments that really impact on me. Part of the pressure is that there is not much that I can do about it. I am relying on—and have every confidence in—all of our fire and emergency services to do the right thing, but part of that additional pressure is that I'm in Melbourne in the State Control Centre, and while I don't have that direct control, I'm wanting the best outcome for everyone."

#### On seeking help when you need it:

"We all struggle, and we all know that. We ask: 'how full is the bucket?' and there have been times for me in the last few months where the bucket has been very, very full. There was a period a few months ago where actually, the bucket overflowed. I knew the bucket was getting quite full, and then we had that tragic event in Victoria in April 2020, where four police officers were killed. Given my previous career, and my close association with Victoria Police, that tipped me over the edge. There were some people that noticed that was the case, and I knew myself, and it meant that I sought professional help. I needed to have a chat with someone who could talk it through with me, and they told me what I was going through was very normal. My tip I encourage you to take—and we are getting better at this, but we need to get better still—if the bucket is full, if you are not travelling well, there is no stigma attached to putting up your hand, and saying I need a hand. Please, make sure you do."



**CHIEF OFFICER MARK JONES QFSM  
SOUTH AUSTRALIAN COUNTRY  
FIRE SERVICE**

**On understanding and  
accepting pressure:**

"The important focus is that the pressure is one we have chosen for ourselves. As emergency service leaders, we exist because emergencies happen. We should recognise that pressure is just part of the job. The important thing is to recognise that our officers are watching us, staff are watching us, so we need to cope with the pressure, and everyone has their own personal style with that ... The profession we have chosen for ourselves deals with terrible things. Fires and emergencies are why our profession exists in the first place. So don't blame yourself for when those things happen; we'll be held to account when we respond thereafter. Keeping a positive attitude is really important, and [so is] surrounding yourself with the best people that you can."

**On using communication  
to combat pressure:**

"Talking to people is important to me. I'm quite an extroverted person, and sharing the experience, listening to others' experiences and learning the pressures they're under, lets us see that we're all in the problem together. That's a great problem shared, problem halved approach. It is important to keep talking. When you feel most under pressure, it's very easy to withdraw and not communicate with your own people. But that's never a good place to be—so I encourage people to keep talking, no matter how much pressure you're under."



**COMMISSIONER ROB ROGERS AFSM  
NEW SOUTH WALES RURAL  
FIRE SERVICE**

**On self-care to support the team:**

"Everybody has a responsibility to manage their own stress. Doing things in your downtime to manage stress helps the agency in turn. So if you focus on looking after yourself, looking after your health, looking after your own stress, then your contribution becomes even better for the agency you're working for. It is important to look after yourself to be the best you can be in whatever role you are doing. And every role contributes—whether you are processing an invoice or putting out a fire, it is all important work. You are part of a team, so we need everyone to work well in that team."

**On taking a moment during  
high-stress situations:**

"To deal with difficult situations like the fire season we just had, I try and maintain a sense of humour. Have a laugh with your colleagues—obviously when the time is right—because those sort of things can make a huge difference to people's stress levels. I have seen personally where an individual is doing it tough due to something that's happened in the field, and just talking to them helps break that stress, helps them recentre. It's really important, whether it's having a laugh or going for a walk periodically, just to make sure you can reset and keep focused on the task."



**ASSOCIATE PROFESSOR CHRISTINE  
OWEN – UNIVERSITY OF TASMANIA**

**On how the brain responds to stress:**

"When pressure starts to exert itself, especially if it is from some sort of external source, we interpret that in many cases as some kind of threat. What happens then is that it goes back to the very basis of [the] human species' origins, the 'flight, fight or freeze' response. Our thinking stops being analytical and creative, we stop thinking outside the square, and under those circumstances we become influenced by emotions and intuition ... And if we're facing a situation that is volatile, uncertain, novel or not part of a routine that we've seen before, that in itself is a form of pressure because our brains have to put in more effort to try and make sense of the situation."

**On how leaders support teams  
to work best under pressure:**

"What effective crisis leaders do is create a climate where people feel empowered, and empowered to speak up about a concern or an observation that might not fit with the current narrative. When people in teams are feeling empowered, they are more likely to persist for longer, they will put more effort in, they are going to be more creative in the ways they problem solve. Under those circumstances, they are likely to be more resilient, flexible and agile." ■

**"When people in teams are feeling empowered, they are more likely to persist for longer, they will put more effort in, they are going to be more creative in the ways they problem solve."**

Associate Professor Christine Owen

# PERSPECTIVES FROM THE SECTOR

**STUART ELLIS AM**

Chief Executive Officer, AFAC



For each issue of Fire Australia, AFAC CEO Stuart Ellis interviews a senior AFAC leader. This issue he caught up with Darren Klemm AFSM, Commissioner, Department of Fire and Emergency Services, Western Australia.

Below: Fire and Emergency Services Commissioner Darren Klemm AFSM shows Premier Mark McGowan and Minister for Emergency Services Francis Logan around the DFES State Operations Centre during the bushfire complex in January 2020.

**What has been your path to Commissioner at the Department of Fire and Emergency Services (DFES) in WA?**

I joined the South Australian Metropolitan Fire Service 30 years ago as a career firefighter, where I spent three years, before moving back to Western Australia to join the WA Fire Brigades Board in 1993.

I was Assistant Commissioner at the Department's Academy, and subsequently for Metropolitan Operations, before I was appointed Fire and Emergency Services Commissioner in September, 2017.

Some of the more significant incidents I've dealt with have been the Toodyay bushfire in 2007, the Yarloop-

Waroona bushfires in 2016, and Tropical Cyclones *Olwyn* in 2015 and *Veronica* in 2019.

My focus for the Department has been on driving investment in mitigation; improving relationships with volunteers and other stakeholders; and fostering greater interagency collaboration.

I am the DFES 'Male Champion of Change', a role that I have held since the inception of the Fire and Emergency Services Male Champions of Change group in April 2017.

In 2019, I was named Leader of the Year by the Institute of Public Administration Association Western Australia.

**What do you see as the benefits of being one government department incorporating fire and emergency services?**

DFES is the hazard management agency for the prevention, preparedness, response and recovery of nine major hazards, and the key government advisor concerning all emergency management matters.

DFES relies substantially on 26,000 emergency services volunteers and more than 1,000 career firefighters across WA. Operating through a government department framework assists in creating one entry point for volunteers and career personnel to access training, resources and support.

It allows for greater efficiencies during the different phases of

emergency incidents and fosters resilience and self-sufficiency in communities when they are faced with bushfire and other natural hazards risks.

**What do you see as the major challenges facing WA?**

In WA, emergency management services are delivered across 2.6 million square kilometres—the largest jurisdiction in Australia—to a population of more than 2.5 million.

Covering the expanse from the north of the country to the south is a significant challenge.

It's common for cyclones and bushfires to occur concurrently in different parts of the state between November and May, which adds complexity around prioritising resourcing. With Perth being one of the most isolated cities in the world, additional time also needs to be factored in when requesting intrastate and interstate assistance.

Fostering collaboration across the emergency management sector, which includes local government, land management agencies and support agencies, is key to managing this challenge.

**You are on the AFAC Board. Do you have a view about the benefits of engaging with AFAC?**

There is an outstanding level of sharing of knowledge and resources that occurs





Department of Fire and Emergency Services WA Commissioner Darren Klemm AFSM.



Fire and Emergency Services Commissioner Darren Klemm AFSM and Bushfire Risk Management Officer Metro North East Mellanie Culhane visiting a Crown land prescribed burn in Mount Helena in October 2019.

across the country in our sector. We all have our own challenges; however, when people are doing it particularly tough in one part of the country, we all help where we can.

AFAC is a central part of creating a strong level of collaboration and cooperation. It provides a national platform for the exchange of personnel, resources, support, firefighting capability, information and expertise.

It also assists in establishing national best-practice guidelines, processes and practices, along with developing a greater propensity to work on and share solutions throughout the sector.

There were several wins in 2020 by the Commissioner and Chief Officers Strategic Committee and the National Resource Sharing Centre, which would not have been possible without the existence of AFAC.

**You have advocated for a national college for fire and emergency services. Would you like to expand on that?**

I am a passionate advocate of the formation of a national body that is run, funded and administered by experts in the emergency management sector.

The vision I would like to see unfold is for a peer-to-peer organisation that recognises and fosters the skills, capabilities and talents involved in managing large-scale emergency incidents.

It's an area I've championed since



Left: Statewide Operational Response Division (SWORD) Kewdale facility opening, November 2017.

my time at the DFES Academy, where I helped with the establishment of the Emergency Management Professionalisation Scheme (EMPS).

I am a firm believer in creating high-level opportunities to share knowledge and bolster professional learning through an accredited national centre.

There is a growing appetite among Australia's fire and emergency commissioners to see a national college come to fruition to 'professionalise' the sector. Emergency management is not a job—it is a profession.

**WA has created a Bushfire Centre of Excellence. What is your vision for this Centre?**

The Bushfire Centre of Excellence

will bring rural fire management and training under one umbrella. Bushfire management across WA is best approached together, with all our stakeholders—and this will be reflected in the way the Centre operates.

The Centre, which officially opened in January, provides high-level training for firefighters and emergency services personnel, with a focus on harnessing lessons learned and promoting the best from academia, science and Aboriginal traditional land practices.

It brings together experts in technology, knowledge, management, engagement and outreach and will inform all future policy, practice and procedures in fighting bushfires across WA, creating a safer state. ■



PHOTO: STATE LIBRARY OF NSW

Above: St Mary's Cathedral.

The fire was first spotted at 9pm, but by 9.30pm the whole roof was on fire.

Right: St Mary's Cathedral.

Only the façade, the bell tower, and part of the north-east transept were left standing.



ILLUSTRATION: STATE LIBRARY OF NSW



PHOTO: NSW GOVERNMENT

The burnt-out shell of St Patrick's Cathedral, Parramatta, after the fire in 1996.



PHOTO: NSW GOVERNMENT

St Patrick's, Parramatta, during the fire.

## NSW CATHEDRAL CALAMITIES – 1865 AND 1996

BY **BARRY LEE OAM**

The spectacular 2019 fire in the historic Notre Dame Cathedral, Paris, focused international attention on the vulnerability of such heritage buildings. The fire engulfed the upper structure of the cathedral as it was undergoing renovations. It destroyed the 91-metre spire and the roof, threatened the twin medieval bell towers and prompted frantic efforts to salvage precious artefacts. The forest of 850-year-old roof timbers combined with the lack of automatic fire protection virtually ensured rapid fire development. Only dogged fire brigade work averted total destruction.

### 'What has happened can happen'

In 1985, the tower of Luxembourg's main cathedral caught fire and burned down. In 2004, a fire in the Duchess Anna Amalia library in Weimar, Germany, caused an estimated €80 million damage. In Italy, the historic La Fenice Opera House was destroyed by fire and, a year later, the same happened at Turin's Sindone Chapel of the Holy Shroud.

Australia is not immune and two NSW examples illustrate the point.

St Mary's Cathedral is the seat of the Archbishop of Sydney and is the world's largest ecclesiastical building in the

English Gothic style. The first St Mary's was built on land given to the church by Governor Macquarie, who laid the foundation stone in 1821.

All was lost on the night of 29 June 1865, when fire destroyed the cathedral, leaving only Augustus Pugin's façade, the bell tower and part of the north-east transept. A contemporary account stated that it was "by far the largest and most disastrous conflagration which has ever occurred in Sydney ... and resulted in the total destruction of St Mary's Cathedral. This noble edifice which was one of, if not the finest, example of church architecture in the colony is now an unsightly ruin. The cost of the building, it is thought, could not be less than 50,000 pounds."<sup>1</sup>

It continued, "fanned by a strong westerly wind, the fire was first seen after nine o'clock. By half past nine the whole of the roof of the building was covered with flame. Parts of Hyde Park could be seen as distinctly as by daylight. The interior of the cathedral was a vast furnace of fire. The magnificent organ, costing originally upwards of 2,000 pounds, was destroyed in the general wreck. The ceiling, which was an imitation of the vaulted groined ceilings of the middle ages, was of polished cedar; in many places it touched the roof—no sooner did the fire reach the former than it burst through the shingled

portion of the latter."<sup>2</sup>

The fire in St Patrick's Cathedral, Parramatta, "caused a great amount of despair in the community."<sup>3</sup> An earlier church was built on the site in 1854 based on a design by Pugin. In 1936, a new church was constructed, incorporating the tower and spire from the earlier building. It became a cathedral in 1986.

In 1996 a fire, the work of an arsonist, almost completely destroyed the building, leaving only the outside walls and tower standing. The fire caused an estimated \$5 million damage. A new cathedral was opened in 2003, and the old cathedral is now the Blessed Sacrament Chapel.

St Patrick's Cathedral in New York City, built in 1878, installed a partial water mist system during recent renovations. Washington National Cathedral, built in 1912, is installing automatic sprinkler protection as part of a renovation, spurred on by damage from a 2011 earthquake. And in Melbourne, a partial automatic sprinkler system is installed in St Paul's Cathedral. ■

1. Sydney Morning Herald, June 30 1865.

2. If you walk along the eastern façade of St Mary's Cathedral, you will come upon an old wall at odds with the rest of the beautiful sandstone exterior. This fragile piece of the past is all that is left of the first church that burned down in 1865.

3. Brazell, M, 19 March 2011, 'Parish Profile—St Patrick's Cathedral Parish, Parramatta'.



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BY **JESSICA TEMPLE**

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FPA Australia

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## TECHNICAL ADVISORY COMMITTEES

The most recent round of TAC meetings was held in November via web conferences. The next round will be in March 2021.

### TAC/1 Maintenance of fire protection systems and equipment

The TAC reviewed its work program from 2020 and began preparation for the 2021 work program, which will continue to focus on the draft project proposal for the revision of AS 1851-2012.

### TAC/2 Fire detection and alarm systems

Progress continues on the draft Good Practice Guide on speaker layout and an Information Bulletin on building occupant warning systems. The TAC discussed the differences between visual alarm devices (VADs) and visual warning devices (VWDs).

### TAC/3/7 Portable and mobile equipment

Like TAC/1, this TAC reviewed its work program from 2020 and began preparation for the 2021 work program. The ACCC mandatory standard update remains a key focus for the TAC.

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

The TAC discussed several technical issues including incidental high hazard storage and protection of lift shafts as well as sprinkler protection for UPS rooms and data centres containing lithium ion batteries.

### TAC/11/22 Special hazards fire protection systems

The TAC closed off their 2020 work program, which included monitoring and many submissions to consultations regarding PFAS and firefighting foams. The TAC has also continued to monitor the progress of FP-011 and FP-002 standards: see right.

### TAC/17 Emergency planning

The TAC continued discussion on the current COVID-19 situation and what that means in regard to emergency evacuation procedures and any future guidelines that may be required. The TAC discussed differences between VADs and VWDs. Work continues on several technical documents.

### TAC/18/19 Passive fire protection

Work continues on several technical documents including the update of PS-05 *Product compliance and evidence of suitability* and development of a Good Practice Guide on intumescent dampers. The TAC continued discussion of passive training.

### TAC/20 Bushfire safety

This TAC did not meet this round, but continues to monitor and provide input to future AS 3959 work.

## STANDARDS

### FP-002 Fire detection and alarm systems

Public comment on amendments to AS 1670.1, AS 1670.3 and AS 1670.4 closed on 6 February 2021. Work continues on the AS 1670.6 revision.

### FP-004 Automatic fire sprinkler installations

Public comment on the revision of AS 2118.2 is being resolved while work continues on the revision of AS 2118.6.

### FP-009 Fire hydrant installations

Public comment on the revision of AS 2419.1 closed on 29 January 2021. Meanwhile, the draft new standard for STORZ connections (2419.4) is at committee ballot.

### FP-011 Special hazard fire protection systems

The revisions of AS 3772 and AS 4587 were published on 18 December 2020.

### FP-020 Construction in bushfire prone areas

Amendment 2 to AS 3959:2018 was published on 18 December 2020.

### FP-022 Fire protection of mobile and transportable equipment

Work continues on the revision of AS 5062.

### LG-007 Emergency lighting in buildings

Public comment on the AS/NZS 2293.1 and AS/NZS 2293.3 amendments (set to close on 7 January and 11 January, respectively) was extended to 15 February for both.

### LG-011 Photoluminescent exit signage

Draft new Australian Standard AS 5358.1.1 *Photoluminescent exit signage: product specification, installation, and operation* went to public comment, which closed on 16 February. Work on an associated routine service and maintenance standard will start when this standard is completed.

### TS-001 Building commissioning

The draft new Technical Specification for building commissioning (DR SA TS 5342) has gone to peer review.



## **FIRE AUSTRALIA CONFERENCE AND TRADESHOW 2021**

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A full list of upcoming events and links to previous presentations are at the FPA Australia website: [www.fpaa.com.au/events.aspx](http://www.fpaa.com.au/events.aspx).

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# MOVERS AND SHAKERS



## Rohan Scott

Rohan Scott has been appointed as ACT Rural Fire Service (RFS) Chief Officer, having acted in the role since April 2020.

Starting his career as a member of the Molonglo ACTRFS Brigade, Rohan brings more than 20 years of local fire knowledge to the position. Notably, he was on the frontline of the 2003 Canberra firestorm and filled critical operational roles during the 2019–20 Black Summer bushfires.



## Dr Stephanie Rotarangi

After holding a series of senior positions in Victoria's fire and emergency sector, Dr Stephanie Rotarangi is returning to her native New Zealand to take the position of Chief Executive at Napier City Council.

In Victoria, Dr Rotarangi held the positions of Deputy Commissioner Emergency Management Victoria, Deputy Chief Officer and Executive Director at Country Fire Authority and Chief Fire Officer at the Department of Environment, Land, Water and Planning.

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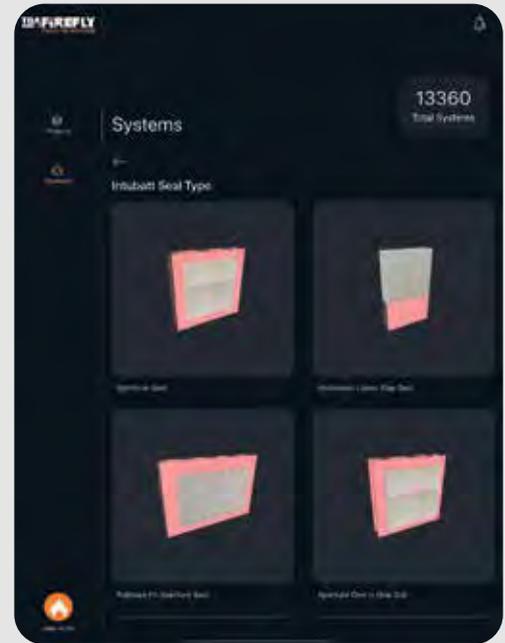
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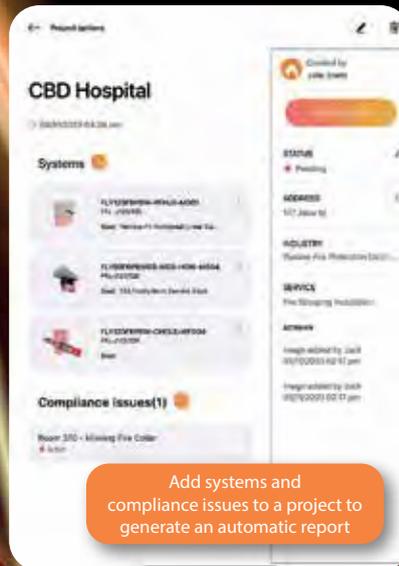


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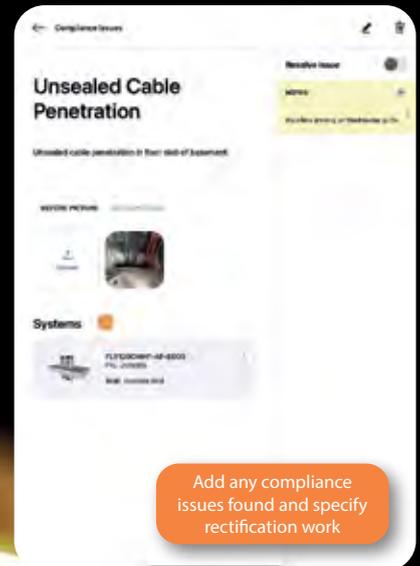
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