



HUMAN FACTORS RESEARCH EVIDENCE ENHANCES AIIMS INCIDENT MANAGEMENT CAPABILITY



AFAC RESEARCH UTILISATION CASE STUDY

Critical success factors:

- Make research evidence accessible and meaningful
- Actively engage, involve and inform end users
- Provide professional development opportunities
- Expect indirect and different routes to utilisation

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Incident Controller Alistair Drayton (left), of the CFA, briefs the State Controller, Craig Lapsley, and other agency personnel during the Wye River fires. Photo: Lucy Bell

Synopsis

What goes on in the minds of Incident Management Team (IMT) members and their leaders when managing complex natural and man-made emergencies and how do they communicate and coordinate these thoughts to work with others?

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

AIIMS is a common platform of emergency management doctrine for managing all types of incidents in Australia. Industry protocols, memoranda of understanding, standing orders and procedures across all agencies and jurisdictions are underpinned by AIIMS doctrine. The system can be adapted and scaled to manage any natural and/or man-made disaster or emergency, from car crashes to bushfires, blue-green algae outbreaks or bio-security threats, as well as to novel and potentially unknown threats. It has been applied effectively during thousands of incidents, including the most catastrophic and tragic disasters in Australia's recent history.

“ AFAC member agencies have invested in this research and its utilisation over the past decade. Their investment helps to ensure a robust emergency management system and provides agencies with evidence-based insights and resources for building their response capability.”

The ongoing development and revisions of AIIMS reflect the sector’s maturing capability in emergency management. The current AIIMS system encapsulates two decades of learning and experience and review, says AFAC’s CEO Stuart Ellis.

The review of the doctrine has drawn on the insights and evidence from the research of the former Bushfire Cooperative Research Centre (Bushfire CRC) and the Bushfire and Natural Hazards Cooperative Research Centre (BNHCRC), as well as shifts in thinking and policy from guidance received through reviews and inquiries into recent major emergencies in Australia.

AIIMS incorporates the research on human factors and the impact of human psychology and human behaviour on how incident management teams and incident controllers perform.

AFAC member agencies have invested in this research and its utilisation over the past decade. Their investment helps to ensure a robust emergency management system and provides agencies with evidence-based insights and resources for building their response capability. It also equips them to identify and address gaps and opportunities for effective application in all hazards by all agencies.

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

The research outputs were used to enhance the overall system and have guided development of a growing portfolio of practical, evidence-based learning, training and exercising resources to support application of AIIMS and to assist those developing IMTs for the task.

This case study explains how the research made its way into practice, outlining the approach to utilisation and subsequent adoption by IMTs, as told by the researchers, end users and the key people in between who helped transition the knowledge into practice. Overwhelmingly, they report that agency collaboration through AFAC together with professional development have been the key factors that have driven uptake of the research evidence in practice.

For further information on AIIMS, contact Sandra Lunardi, AFAC’s Director of Workforce Development, at sandra.lunardi@afac.com.au. For further information on research utilisation, contact Noreen Krusel, AFAC’s Manager Research Utilisation at noreen.krusel@afac.com.au

The stages of AIIMS

The key stages in the maturity of incident management capability in Australia.

**1980s-
1990s**

Introduction and application

AIIMS introduced in Australia, adapted from its US counterpart National Interagency Incident Management System (NIIMS).



2000s

Collaboration and partnerships

AIIMS Steering Group established to oversee the critical review of AIIMS.

- AFAC secures grant to launch the CRC nationally coordinated research and development program in the wake of the 2003 Canberra fires.
- The AFAC Council appoints the AFAC Steering Group as custodian of AIIMS and as the critical reference group for facilitation of national collaboration and stakeholder engagement.



**2005
onwards**

Research and innovation

- Bushfire CRC researchers engaged in a four-year study to investigate capability and coordination of IMT team members and human factors that influence their performance.
- Interim revised edition of AIMS-3 released to respond to targeted recommendations from public inquiries into major emergency incidents, including the 2009 Victorian Bushfires Royal Commission.
- Interim review of AIMS followed by extensive national consultation to incorporate research findings from Bushfire CRC research and in response to further recommendations from the 2009 Victorian Bushfires Royal Commission.
- AFAC releases **AIMS-4** founded on an evidence base from the CRC research and the impact of human psychology and social behaviour on teams and teams managing emergency incidents.
- Bushfire CRC concludes and the Bushfire and Natural Hazards CRC is launched, continuing research into emergency management, multi-agency coordination, team monitoring and organisational learning.
- As part of ongoing continuous improvement, **AIMS-4** is now being updated, underpinned by CRC research, and facilitated by AFAC and the AIMS Steering Group and its committees.





Photo: Fire & Rescue NSW

Human factors and IMT performance



Human factors – how people think, behave, decide, react, communicate and relate – are integral to how effectively IMT members use AIIMS to resolve emergencies.

Social and behavioural scientists for the former Bushfire CRC showed how common human characteristics and traits, such as our human limits on memory, speed of thinking, problem solving, decision making, tolerance of risk, communication styles, as well as unconscious and conscious bias, could hamper individual and team performance. It also highlighted how IMT members and Incident Controllers (ICs) could use these insights to perform at their optimum, especially in volatile and uncertain conditions.

The main premise, explains AFAC's Director of Workforce Development Sandra Lunardi, is that the greater awareness IMT members have of the human factors that shape their thinking and behaviours, the better they will perform individually and as a team. Similarly, the greater the awareness of the relevant knowledge, skills, abilities and other requirements that agencies have, the better they can support development of their IMTs and build their talent pipelines, says Sandra.

The AIIMS-4 Training Resource Kit (TRK), a dedicated resource for training in the principles of AIIMS, draws on CRC human-factors research conducted from 2005 to 2014. This includes understanding the role and impact of human factors in decision making, communicating, relating with other team members, and the role of self-awareness in enhanced leadership and teamwork. The research also underpins the equivalent AFAC online module, AIIMS Principles Online.

The research also informed other key elements of doctrine, such as the set of AIIMS-4 Aides-memoire, the AIIMS-4 gap training "Moving from AIIMS-3 to AIIMS-4", and the review of all of the operational and command and control units within the PUA12 Public Safety Fire Qualifications.

A portfolio of additional resources and materials has also been published to support IMT capability development. These include resources on how to conduct debriefs, decision making under pressure, and how to develop simulations for training and exercising.

Key research insights at a glance



AIIMS-4 draws on research evidence from two large Bushfire CRC projects. These were:

The Safe Behaviour and Decision Making Project

Led by Dr Mary Omodei of La Trobe University, this work investigated and identified a range of human factors relevant on the fire ground, such as reluctance to change plans, mental overload, under-estimation of incident development and over optimism in suppression tactics. Related PhD research also found that worst-case-scenario thinking and pre-mortems could be used tactically for effective incident management. Further PhD work also lent evidence to the observation that pre-formed IMTs performed more effectively than those assembled ad-hoc. This insight has informed agency strategies for resourcing IMTs.

The Enhancing Emergency Incident Management Team Effectiveness and Organisational Learning Project

Dr Christine Owen of the University of Tasmania and her co-researchers studied communication between IMT members and found that the way knowledge is shared and managed can enable or constrain IMT operations. This work showed that IMT performance could be strained in escalated, complex conditions. Specific communication strategies used by IMT members supported teams to be more adaptable and flexible and to get better outcomes including better information flow between the IMT and the incident ground (see *Fire Note 45*). The research group also observed IMTs in incident control centres and concluded that the ways in which teams are physically established sets the tone for how information flows throughout the IMT. Different configurations were observed to create either a smooth flow of information or congestion. Differences were also found in patterns of interaction between functional units (e.g. planning and operations).

Following is a brief snapshot of some of the key research findings embedded in AIIMS-4 and the associated suite of learner resources.

Unlock the “super human factor”

Dr Mary Omodei described self-awareness as the “super human factor” and a critical element of IMT effectiveness. It is of the highest order, operating in and behind people’s thought processes, mindsets and skill sets.

According to Dr Omodei’s work, while the human mind is not well matched to the complexities of emergencies we can learn to overcome the impact of our weaknesses by playing to our strengths, potentially reducing the margin for human error and mistakes. This theme is interwoven throughout the AIIMS-4 resources as an element of situational awareness.

Self-awareness, according to Dr Omodei, allows people to transcend those human factors that normally constrain performance, indicating how and why “we think, behave and feel certain ways”, as well as knowing when to use or address them.

While human error cannot be completely eliminated, according to Dr Omodei, it can be managed through learning to monitor self and team human factors in areas such as thinking, relating and coordinating.



Emergency relief briefing at Apollo Bay. Photo: Lucy Bell

Beware the biases

The research spotlighted innate cognitive biases in thinking processes – conscious and unconscious – that could potentially derail incident controllers and their teams. The AIIMS-4 TRK alerts IMT members to be aware of these cognitive biases so they can mitigate their effects in making sound operational decisions. Some of the biases identified in the research include, but are not limited to, interpreting information to individual pre-conceived terms of reference; relying too heavily on single, specific or inaccurate information; interpreting an event according to a frame that is too narrow, thereby missing other, important outcomes; underestimating or overestimating task completion times, and making faulty decisions for group consensus or so-called “groupthink”.

Relate and communicate

Good incident controllers, as rated by their teams, keep communication channels open, manage and target the flow of in-bound and out-bound information, and keep all the key players on the same page.

However, breakdowns in communication and information disconnects tend to arise when situations don't go as planned, especially when IMT members are faced with complex and chaotic conditions.

This was among the key findings of a series of research projects on the role and impact of effective communication in IMTs led by Dr Christine Owen and co-researchers for the Bushfire CRC. Their work highlighted the role and scope of briefings and debriefings, as well as after action reviews, in enhancing performance. It also drew attention to the need to be mindful of how stress can impact on how well people communicate and relate to others when stretched or fatigued. This work is built into the AIIMS-4 TRK and in several of the research utilisation resources developed to support the implementation of AIIMS doctrine.

Science and lessons learnt in IMTs

Gregg Paterson, Regional Commander at CFA Barwon South West Region, says incident management has changed dramatically through AIIMS from “traditionally autocratic command and control operations to more integrated and higher performing teams”.

“Back in the early days it was thumping tables and dictating orders ... AIIMS today is very much about team-based decision making,” he says.

“The skill sets for incident controllers have changed. Today it is more about facilitating conversations between team members. It’s about working together to ensure they are meeting the State’s Fire Control Priorities as well as the broader expectations of communities and their demands for receiving information in a timely manner.”

The use of scientific evidence in AIIMS, he says, builds trust and confidence in the system and associated learner tools, resources and techniques.

“No two incidents are ever the same, but you bring a lot of lessons learnt to the next emergency event through evidence-based techniques such as those now used in debriefing and decision making.”



A dedicated three-part resource pack on conducting successful debriefs was also developed to build capability in this area and rolled out in a series of professional development events held nationally in 2015. Due to strong demand, these events continued in 2016 as a joint initiative of AFAC and the Australian Institute for Disaster Resilience.

Thinking about your thinking

Incident controllers and IMT members have a lot on their minds. In addition, they need to plan for future events, not just simply what might happen.

Being mindful of your own thinking and what your team can see (common operating picture) can improve situational awareness which provides the relevant information on which to base decisions.

The AIIMS-4 TRK describes practical skill sets and mindsets that can be used to fill gaps in thinking and awareness beyond traditional 6/12/24 hour timelines. These stem from the human factors research of Dr Mary Omodei and her co-researchers.

Worst case scenarios

Claire Johnson’s PhD project for the Bushfire CRC investigated how worst-case scenarios influenced the decision-making processes of Australian bushfire fighters. “A failure to consider worst-case scenario possibilities has been implicated in a number of high-profile investigations into Australian bushfire disasters,” she wrote in a *Fire Note* (see references and resources at the end of this case) on her work.

Worst-case scenario thinking involves identifying possible worst-case events and implementing actions to prepare for those events, she says. The key benefits of thinking this way are that they can help IMT members avoid being surprised by unexpected events, identify faulty assumptions and errors in decision making and develop possible actions to mitigate the severity of consequences if worst-case events cannot be avoided. “While receiving little previous research attention, worst-case thinking is a critical skill that is challenging to develop and difficult to execute.” Dr Johnson’s work is also identified in the AIIMS-4 TRK.

Applying evidence-based techniques at emergencies

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



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

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

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

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

"The predictive tools (PHOENIX RapidFire simulator and decision making support tool), weather forecasts and fire intensity measurement tools, such as infrared mapping, indicated it could be potentially monstrous," he says of the fire which was difficult to access in a steep, thickly forested gully.

"We had all the factors that could fan the progression of spread with hot northerlies, expected south westerlies and dense fuel loads from a long period without fire in that landscape," he explains.

"Factoring in the worst case scenario into strategic planning and modelling, at its worst it could have run as far as Torquay (a residential suburb on the outskirts of Geelong)."

As the fire grew in size and complexity, he had a lot on his mind and some hard decisions to make. Ash Wednesday, the tragic bushfire that swept through the Great Ocean Road in 1983, was also in the back of his mind.

"There were a number of significant areas of pressure," he recalls. "For example, in this case, our primary emphasis had to be on community information, warnings and engagement due to the volume of holidaymakers set to surge in the area for Christmas holidays," he explains.

"In terms of fire control strategy, technical specialists were also required due to the difficult terrain and inaccessibility to the fire.

"Significant police input was also needed to execute the evacuation and traffic management effectively on Christmas Day."

At the same time, fire fighting resources had also been stretched due to the demands of other emergencies around that time.

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

Decision making in these high pressured conditions, he says, comes from your “mental slides”, which are shaped through a variety of factors, such as AIIMS training, development and exercising, together with the memories and experiences learned from previous events. These mental slides are also enhanced by the information from your team and others.

“ You have to think act and reflect ... you find your battle rhythm, remembering to ask yourself what’s working and what’s not,” says Alistair. “You scale up and you scale down, using your slides ...”

“You have to think act and reflect ... you find your battle rhythm, remembering to ask yourself what’s working and what’s not,” says Alistair. “You scale up and you scale down, using your slides. Communication is vitally important – communications throughout the day. It is essential to have formal briefings and two-way updates up and down and between team members and the key stakeholders.

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



Initial Wye River Incident Emergency Management Team briefing at the Colac Incident Control Centre. Photo: Lucy Bell

Building an evidence base

The move to use research evidence in AIIMS started more than a decade ago.

AFAC's partnership with the former Bushfire CRC, now Bushfire and Natural Hazards CRC, formed around this time giving agencies direct access to research expertise from Australia's major research organisations. This paved the way to develop a scientific base to their work for the ultimate benefit of the wider community, explains AFAC's Manager of Research Utilisation, Dr Noreen Krusel.



It was a significant development, as until this time there was no nationally coordinated bushfire/fire research program, explains Noreen. A lot of agencies had done research, but many were duplicating the efforts of others, and there was no transference of information or ability to access that information.

The AIIMS Steering Group was an early front runner to maximise the CRC partnership and moved quickly to leverage the research in human factors, social science and incident management.

The group, which comprises commissioners, chief executive officers and other senior executives from fire, land management agencies and emergency services in Australia and New Zealand, acts as a critical reference group for AIIMS through the AFAC Council.

From their initial engagement in 2006, the CRC human factors researchers have worked closely with the AIIMS Steering Group, the AFAC Director of Workforce Development, Sandra Lunardi, and the Research Utilisation Manager Dr Noreen Krusel. At the same time, they conducted much of their field work within the agencies, using rigorous social science methodologies such as direct interviews, observations, simulations and surveys.

This approach, using established AFAC national collaboration channels and networks, has ensured that the research and strategies for its utilisation meet current and emerging needs of IMTs, explains Sandra.

"This collaboration and engagement works on a number of levels. Early on it helped to build on what we knew through our in-house research efforts, as well as insights from practice. It also created awareness of and an appetite for learning and doing things differently," she says.

"The implications or outputs of research often aren't immediately obvious and often require a considerable degree of translation and sense making.

"End user engagement end-to-end through these established AFAC and AIIMS collaboration processes enables us to translate the research for end users who can then interpret and apply the outputs in their practice."

Direct engagement initiatives, such as professional development, capability roadshows and workshops, have also been used successfully throughout to support uptake of the new knowledge and evidence in agencies, says Noreen.

"These forums give end users hands-on experience with the theory behind the practice and the skills and confidence to take it back and apply it within their agencies."

Increasingly, these events have attracted participants involved in incident management from all agencies and for all hazards, both natural and man-made.

Research in action: Bridging the know-do gap

David Rawet explains how the AFAC collaboration model helped his agency maximise use of AIIMS-4 and its associated learner resources.



Evidence-based change in practice is more likely to take root when the “seeds” are sown early in the process, according to David Rawet of the Department of Parks and Wildlife (DPaW) in Western Australia.

David, who led the training development for DPaW’s transition from AIIMS-3 to AIIMS-4, says early exposure to research and its implications inspired the thinking that typically should occur ahead of any program of change.

This thinking, he says, helped end users anticipate whether, how and where the changes could be incorporated effectively, as well as the steps needed to pave the way for the transition.

“In the lead up to the transition from AIIMS-3 to AIIMS-4, we were kept across the changes and new directions, including the human factors research, through our involvement in AFAC and the relevant collaboration groups,” recalls David.

“In a sense we knew what was coming, long before the roadshows and the AIIMS-4 roll-out. Conversations had started taking place, so when AIIMS-4 arrived we already had a strong sense of what it meant for us.

“These exposures throughout the process seeded the thinking needed to anticipate how we would eventually incorporate the new directions into our IMT operations.

“This level of understanding needs to be there early to enable it to be translated into the agency’s language.”

David is a strong advocate for using evidence in AIIMS.

“Research broadens our experiences. It provides rigour and is another frame through which to view your world,” he says. “It enables us to confirm or deny the assumptions that our individual experience has given us. Research makes us open to the possibilities of different outcomes. It changes the way that we see the world of incident management.

“We accept the practice, until presented with the evidence. For example, the worst-case-scenario research of Claire Johnson (now Cooper) drew our attention to the impact of biases which we may not have previously recognised. This evidence showed that we need to balance the ‘can dos’ with what we can’t do. It’s about finding the balance in those areas of tension faced by incident managers.”

Critical success factors

Researchers and end users representing agencies share their insights on the factors critical to the successful utilisation of evidence in AIIMS-4 and related resources.



Actively engage end users

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

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

The net effect is that agencies get research outputs that they need, want, and can use for AIIMS, according to both the researchers and end users.

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

"For example, we engaged directly with the AIIMS Steering Group, the AFAC Director of Workforce Development, the Research Utilisation Manager and the Learning and Development Group. We considered and built on the findings of previous research initiatives, involved agencies in setting the research questions and in conducting the field work and surveys. As well as presenting the outcomes of our findings along the way, we also created a common space to help the end users understand the research outcomes and implications in terms of their people, businesses and broader policy goals."

Make research evidence accessible and meaningful

Traditional research reports often leave it to the reader to work out or interpret the findings for meaning and implications, according to David Rawet.

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

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

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

Making research utilisation easy, according to Christine Owen, also means "getting beyond the barriers of time and place".

"The challenge for people is taking time off. For AIIMS we didn't want to remove people from their environment, but we wanted them to think strategically and critically about the research questions and implications," she recalls.

"To overcome this challenge, for example, we created a Wiki (a web enabled content sharing and collaboration space). We put out a high-level call to contribute and identify the opportunities and barriers and then progressed by teleconference. It provided a short, sharp process for discussion and decision making."



Research observations at an IMT exercise.

“We had meaningful conversations about what all the findings meant and follow up discussions about implications for practice and training and exercising. We directly engaged the key decision makers and policy makers within agencies and within the AFAC working groups, such as the AIIMS 4 Steering Committee. We worked alongside that group in its deliberations, having workshops as well as teleconferences to help understand their issues and to explain the implications of some of the research findings.”

Alignment: consider timing and demand

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

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

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

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

Set boundaries but be flexible

Christine says flexibility to adjust the research process has been a key success factor in AIIMS-4.

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

“Typically, it’s also a good idea to get support for your deliverables up front. Failure in utilisation often occurs where this flexibility and support hasn’t occurred.”

Christine says researchers typically and ideally see their science as remaining independent of influences such as funding or end user interests.

“These boundaries need to be established early so that you don’t feel compromised or pushed to achieve results or remain blind to the industry’s needs.”



Photo: CFA Communities and Communication

Conclusion: Final thoughts

Engage, consult and involve

Research can provide useful insights on how to review and improve performance, says David Rawet.

However, research that gets used, is more likely to have been shaped by practitioners involved end-to-end and from early on in the process.

The national approach to AIIMS development through AFAC and the CRC showed how this could be achieved through a concerted program of engagement and consultation, using established multiple touch points and check points with the end users and broader sector.

“Collaboration through AFAC brought ideas, knowledge and insights on best practice which in turn, have filtered through our entire AIIMS training programs,” he says.

Expect indirect and different routes to utilisation

David advises that it is important to be realistic about the deliverables of and timelines for research utilisation more generally.

“Research doesn’t always result in a specific outcome, or an outcome the researcher may have anticipated,” he says.

“Research utilisation is not a direct route. Often it makes its way into operations through different routes. It can also just come about from seeping into our individual or collective consciousness.”

Access available networks and industry intelligence

Use, but don’t over-rely on individual industry end user representatives, suggests Christine Owen.

“It is important to understand that while the end user representative role is critical, these individuals aren’t the be all and end all of research utilisation,” she says.

“If we’re moving to a place of greater maturity using research within our sector, then we need to recognise the opportunities for and limits on using individuals as the face of utilisation.

“End users have to have their finger on the pulse, keep it real, practical and open doors. They’re typically passionate and directly engaged and can provide access to networks and insights.

“But to make a deep seated change in practice, there’s another new level required that involves tapping into industry needs and issues. We can’t expect an end user representative to do all that.

“That’s why it is important to access influential national organisations such as AFAC and its resources, and to engage the collaboration groups in the process,” she says.

Reflecting on her experience of research utilisation, Christine concedes that there is no set pathway or formula for success.

Utilisation, more often than not, she says, results from a convergence of external and internal factors (such as directions in policy, culture or practice change) that influence or create demand for learning and innovation through research, she says.

“While there were a range of factors critical to our success, being in the right place at the right time undoubtedly generated and maintained demand for using human factors and IMT research in AIIMS-4.

“Our challenge is to recognise and create opportunities for these moments to occur more frequently.”

Read, click, watch



Fire Notes

Fire Note 44. 2009. [How human factors drive decisions at fire ground level.](#)

Fire Note 45. 2009. [Organising for high reliability in emergency management: An empirical link.](#)

Fire Note 73. 2011. [Strategic implications for incident control systems in Australia and New Zealand.](#)

Fire Note 77. 2011. [How bushfire fighters think about worst case scenarios.](#)

Fire Note 106. 2013. [The influence of familiarity on teamwork and decision making.](#)

Reports and resources

Dwyer, I & Owen, C. 2009. Emergency incident management: An evolving Incident Control System framework, *Journal of Pacific Rim Psychology*, 3 (2). pp. 66-75.

Hayes, P. 2014a. *Decision making under pressure: A resource for incident management teams*. Melbourne: AFAC.

Human Factors Interview Protocol (HFIP). An [interview guide](#) for investigating the human factors that affect operational decision making.

Johnson, C. 2014. Expert decision making and the use of worst case scenario thinking in Owen, C. (Ed.), *Human factors challenges in emergency management: Enhancing individual and team performance in fire and emergency*, pp.35-55. Farnham: Ashgate. UK.

Owen, C (editor). 2014. *Human Factors Challenges in Emergency Management. Enhancing Individual and Team Performance in Emergency Management*. Ashgate, United Kingdom.

Owen, C. Douglas, J. & Hickey, G. 2008. Information flow and teamwork in Incident Control Centres. *Proceedings of the 5th International ISCRAM Conference – Washington, DC, USA, May 2008*. F. Fiedrich and B. Van de Walle, eds.

Owen, C & Dwyer, I. 2009. Review of incident management teamwork and multi-agency collaboration. Bushfire CRC.

Owen, C (Ed.) and Hayes, P. 2014. [Human factors challenges in emergency management](#). in Owen, C (Ed.), *Enhancing individual and team performance in fire and emergency*. Extract. Chapter 1. Farnham: Ashgate. UK.

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