



Australian Government  
Attorney-General's Department

# THE AUSTRALIAN JOURNAL OF EMERGENCY MANAGEMENT

Volume 25 | No. 2 | April 2010



## THIS ISSUE'S COVER STORY:

Australia's involvement in the Haiti relief and recovery operation

Building disaster  
resilience

What can Australia's floods and  
fires teach us about resilience?

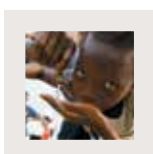
How resilient are our  
organisations?

# Contents

Volume 25 | No. 02 | April 2010

Please note that contributions to the Australian Journal of Emergency Management are reviewed. Academic papers (denoted by **R**) are peer reviewed to appropriate academic standards by independent, qualified experts.

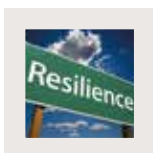
**Foreword: Building disaster resilience** **2**  
By Mike Rothery, First Assistant Secretary, National Security Resilience Division, Attorney-General's Department.



**Disaster strikes on a massive scale** **3**  
Part of a global disaster management network, Australian Red Cross is playing an active role in the Haiti relief and recovery operation.

**A 'conceptual models' approach to organisational resilience** **6**  
Gibson and Tarrant discuss the range of inter-dependant factors needed to manage organisational resilience.

**The organisation: Risk, resilience and governance** **13**  
Tarrant argues that a solid risk management strategy is critical to building effective, transformational and adaptive organisations.



**Organisational resilience** **18**  
Parsons argues that a modern organisation's ability to survive and prosper against the flow-on effects of natural disasters will depend on its resilience capacity.



**Resilience and risk management** **21**  
Dahms argues that compliance against a universal set of rules reduces resilience.

## The Australian Journal of Emergency Management

Vol. 25 No. 2, April 2010 ISSN: 1324 1540

### ABOUT THE JOURNAL

The Australian Journal of Emergency Management is Australia's premier Journal in emergency management. Its format and content is developed with reference to peak emergency management organisations and the emergency management sectors—nationally and internationally. The Journal focuses on both the academic and practitioner reader and its aim is to strengthen capabilities in the sector by documenting, growing and disseminating an emergency management body of knowledge. The Journal strongly supports the role of the Australian Emergency Management Institute (AEMI) as a national centre of excellence for knowledge

and skills development in the emergency management sector. Papers are published in all areas of emergency management. The Journal emphasises empirical reports but may include specialised theoretical, methodological, case study and review papers and opinion pieces.

### PUBLISHER




The Australian Journal of Emergency Management is published by the Australian Government's Attorney-General's Department. The Journal is published on the 'Emergency Management in Australia' website at [www.ema.gov.au](http://www.ema.gov.au)

### EXECUTIVE EDITOR

The Editor-in-Chief of the Journal with final responsibility for the Journal's operations and policies is Martin Studdert AM, National Security Capability Development Division of the Australian Government's Attorney-General's Department.

### EDITORIAL ADVISORY COMMITTEE

- Christine Jenkinson, Attorney-General's Department
- Roger Jones, Director, Board of the Victoria State Emergency Service Authority
- Chas Keys, former Director of NSW State Emergency Service
- Prof Jennifer McKay, University of South Australia
- Andrew Coghlan, Australian Red Cross, Melbourne
- David Parsons, Sydney Water Corporation
- Cate Moore, Attorney-General's Department
- Representative of Australian Emergency Management Institute (AEMI)

	<b>Measuring and comparing organisational resilience in Auckland</b>	<b>27</b>
	Stephenson, Vargo and Seville report on a web-based survey tool that allows organisations to measure and compare organisational resilience.	
	<b>Bushfire communities and resilience: What can they tell us?</b>	<b>33</b>
	Pooley, Cohen and O'Connor identify five factors that are important to communities experiences in mediating bushfire disasters.	
	<b>Towards resilience against flood risks</b>	<b>39</b>
	Gissing, Keys and Opper discuss potential advances in flood emergency management through an analysis of the key relationships, trends and challenges facing flood emergency management agencies seeking to increase resilience against flood threat in Australia.	
	<b>Paramedics and public health emergencies: Is there a 'duty to respond' in Australia?</b>	<b>46</b>
	Smith, Burkle Jr, Woodd, Jensen, and Archer examine the concept of 'duty to respond' in the Australian SARS context.	
	<b>National security updates</b>	<b>55</b>
	<b>2010 Australia Day honours list</b>	<b>62</b>
	<b>In profile: Frank Pagano AFSM ESM</b>	<b>64</b>
	<b>Case study: Exercise "Stuffed Goose" – involving Culturally and Linguistically Diverse communities (CALD).</b>	<b>65</b>
	<b>Participation, partnerships, respect and resilience</b>	<b>67</b>
	<b>Interesting websites</b>	<b>68</b>

#### EDITORIAL TEAM

Managing Editor: Anita Cleaver, Rave Communication

Design, typesetting, print management and distribution:  
Chris Robey, Grey Canberra

#### PUBLICATION DEADLINE

The Journal is published on the last day of January, April, July and October, each year. Copies of the Journal are distributed quarterly without charge to subscribers throughout Australia and overseas.

#### CIRCULATION

Approximate circulation: 3,000.

#### COPYRIGHT

Material in The Australian Journal of Emergency Management is protected under the Commonwealth Copyright Act 1968.

No material may be reproduced in part or in whole without written consent from the copyright holders. The views in this journal are not necessarily the views of the Attorney-General's Department.

#### SUBMISSIONS

The Australian Journal of Emergency Management welcomes submissions. Our Contributors' Guidelines are available online at [www.ema.gov.au/ajem](http://www.ema.gov.au/ajem). In brief, contributions should be no longer than 3,000 words, be submitted as an MS Word file and contain photographs, graphs and tables in their original software programs in a separate file. All articles must contain an abstract and a small biographical sentence about each author. We recommend that authors familiarise themselves with the Journal before making a submission. A copyright release form and editorial policy is also located on the website. Contributions should be forwarded electronically to:

[ajem@ema.gov.au](mailto:ajem@ema.gov.au). All academic papers are peer reviewed. Please note that the Australian Journal of Emergency Management is indexed by several indexing organisations throughout the world please visit our website for details.

#### SUBSCRIPTIONS

For your free subscription contact us at [ajem@ema.gov.au](mailto:ajem@ema.gov.au), fax 03 5421 5272 or visit us online at [www.ema.gov.au/ajem](http://www.ema.gov.au/ajem).

Changes to subscription details can be made by emailing [ajem@ema.gov.au](mailto:ajem@ema.gov.au).

#### CONTACT US

Mail Australian Journal of Emergency Management  
Australian Emergency Management Institute  
Main Road, MT. MACEDON VIC 3441

Email [ajem@ema.gov.au](mailto:ajem@ema.gov.au)

Phone [editorial enquiries only] 02 6295 3662

# Foreword

## BUILDING DISASTER RESILIENCE

By Mike Rothery, First Assistant Secretary, National Security Resilience Division, Attorney-General's Department.



**Mike Rothery, First Assistant Secretary, National Security Resilience Division, Attorney-General's Department.**

Australia is struggling with a serious policy and operational dilemma.

The emergency management community is under pressure from ever-increasing demands by Australians for its services, finite limits to its resources, and a likely growth in risk from hazards. Meanwhile, the responsibility for protecting Australia from the impacts of such disasters cannot be borne by the emergency management community alone. Adopting a resilience approach to this dilemma would better enable Australia to adapt to change, reduce exposure to risk and bounce back from disasters.

The Australian community has been steadily increasing its expectations of the role of government in a variety of areas, including emergency management. Whilst advances in technology (particularly communications), have allowed emergency services to be predictive and effective, this success has also raised expectations that communities can be absolutely protected from hazards.

The community has also changed in other ways. We have an ageing population and our cities are sprawling along our coastlines and we are becoming ever more urbanised, with an expectation that the same services will be available wherever we choose to live. There is a

growing expectation that governments will have a long reach to find, protect and support our citizens, wherever they may be in the world.

There is a growing exposure to risk. Some risks are newer and due to changes in our natural environment (such as climate change), while other familiar risks (such as bushfires, floods and storms) are likely to become more intense and more frequent in the years ahead.

Yet, governments are faced with finite capacities to meet these expectations. They are highly dependent on volunteers, with social change placing this resource under stress. They are also faced with constantly competing demands for funding in a context where continuously increasing operating budgets is simply not an option.

New challenges require new ways of thinking and responding. Addressing disaster risk is a complex policy challenge for governments that is not amenable to traditional approaches. As we rapidly approach the limits of our ability to increase our response capacity; 'more of the same' is not the answer.

It is in this context that the term resilience is rapidly becoming accepted as a strategic approach to bring together protective security, emergency management and business continuity management within organisations. Increasingly, this concept is being adopted as a more holistic approach to disasters, where preparation, prevention and recovery are considered equally. It is also a mechanism through which communities can have a clearer understanding of what they can expect of government, and be more adaptable, resourceful, empowered and equitable.

I believe that the contributions to this edition of AJEM are important for our response to this serious policy and operational dilemma as they each seek to provide a perspective on what the concept of resilience might offer for the future of emergency management in Australia.

# Disaster strikes on a massive scale

Part of a global disaster management network, Australian Red Cross is playing an active role in the Haiti relief and recovery operation.

The impact of the 12 January earthquake off the coast of Haiti has left even veteran disaster responders stunned. The magnitude-7.3 earthquake – the biggest to hit Haiti for 200 years – may have left as many as 200,000 people dead and more than a million homeless.

The quake leveled urban landscapes in parts of the country's capital Port-au-Prince and surrounding suburbs and towns, leaving homes, businesses, banks, parks, marketplaces and schools in ruins.



**Camp Daihatsu, an internally displaced persons camp in Port-au-Prince.**

With an epicentre only 15 kilometres from Port-au-Prince – hub of a centralised administration – the earthquake struck at the heart of the country. It caused major damage to the seaport, airport and roads, destroyed parliament and ministry buildings, closed hospitals and crippled the city's telecommunications, water and electricity supply.

The devastation caused by the earthquake has generated one of the largest humanitarian responses ever carried out in a single country. For the global Red Cross network, currently playing a key role in the emergency response, it is fast becoming one of the largest and most complex operations in recent memory.

## Background on Haiti

The earthquake compounded pre-existing difficult living conditions in Haiti. Ranked 149 on the Human Development Index, 80 per cent of Haiti's 8.7 million inhabitants were living in poverty prior to 12 January 2010, with half of the population subsisting on less than \$1 a day.

Alongside poverty, the country's deeper problems included political and social instability with an economy in ruins, chronic unemployment, overwhelming challenges in health, as well as severe deforestation and environmental degradation that undermined farming, inflated food prices, and left the country vulnerable to flooding.

As Tadateru Konoé, president of the International Federation of Red Cross and Red Crescent Societies (IFRC), observed of relief efforts in the aftermath of the earthquake: 'We must confront a natural disaster that is not only one of the biggest of the past decade, but is affecting one of the very poorest countries in the world'. The Haiti earthquake left people in need of more than simple recovery.

## In the aftermath

As part of its global approach to disaster preparedness and management, the Red Cross movement is led by its local society in a disaster zone. Local Red Cross staff and volunteers are usually already involved in relief efforts before international assistance arrives. They are familiar with the communities and context in which they are working and ensure that additional assistance is needed and appropriate.



**Scenes from Haiti, two weeks after the island was hit by 9.7 magnitude earthquake on 12 January, 2010.**

Only moments after the earthquake struck on 12 January, Haitian Red Cross volunteers – many of whom were also left homeless and grieving, lost or missing loved ones – began to assess the impact and administer first aid to the injured. Prepositioned stores of relief items in Port-au-Prince provided an immediate source of aid to approximately 3,000 families. Items included blankets, hygiene kits, tarpaulins and containers for storing drinking water.

Also pre-positioned were funds held by IFRC. Within hours of the earthquake, IFRC had released money from its disaster relief emergency fund to cover the purchase and transfer of additional relief supplies, including food and water from neighbouring Dominican Republic. An international appeal for funds to support response and recovery work soon followed.

Key needs in the emergency relief phase included search and rescue, identification and management of dead bodies, medical assistance and the distribution of immediate relief items including food, clothing, water, shelter and sanitation. Shelter and sanitation continue to remain priorities.

## A local contribution

Australian Red Cross immediately offered its support and assistance as part of the global Red Cross response. Within hours of hearing news of the disaster, the organization established a national appeal through which Australians could contribute to Red Cross relief and recovery efforts. To date, more than \$7 million has been donated by the Australian public, businesses and government.

Australian aid workers, trained and experienced in disaster response, were immediately put on standby as Australian Red Cross awaited requests for resources from staff in the field. The first Australian Red Cross aid worker, a specialist in public health, travelled to Haiti six days after the earthquake. He complemented a team of Japanese Red Cross medical staff tending to the injured out of a temporary basic health care unit set up in a suburb outside Port-au-Prince.

Since then, fourteen Australian aid workers have travelled to Haiti; eight nurses, a midwife, a GP and three experts in shelter and a public health specialist. The medical teams are working with colleagues from across the world in a German Red Cross field hospital. One shelter specialist has joined the committee of 26 organisations overseeing the coordination of shelter activities (Red Cross has taken on the role of lead organisation on shelter), while the other two have joined Finnish Red Cross workers erecting tents and tarpaulins in attempts to provide people with emergency shelter.

Australian Red Cross has also contributed aid supplies, redirecting to Haiti a stock replenishment en route to its storage warehouse in Kuala Lumpur.



Marianne Joseph drinks fresh water from a tank set up by the French Red Cross.

## A global response

More than six hundred international Red Cross aid workers from 37 countries have travelled to Haiti to assist the 10,000-strong staff and volunteer base from Haitian Red Cross.

A record 21 emergency response units – pre-trained teams of specialists from around the world with pre-packed sets of standardised equipment ready for immediate use in emergencies – were flown in from nearby countries in the days that followed. These included self-contained hospitals, as well as health, relief and shelter, water and sanitation, logistics, and communications units.

Logistics, water and medical treatment were immediate priorities for Red Cross, with first aid and water points quickly established in the affected areas. A large base camp was quickly established in Port-au-Prince and relief distribution points were set up in a number of locations in and around the capital. A major distribution point was established in the Dominican Republic's Santo Domingo due to the challenges posed by damaged air and seaport facilities in Haiti.

To date, up to 2000 patients are being treated daily by medical professionals and 7 million litres of clean drinking water are being produced and distributed in 112 different locations each day. One hundred and fifty thousand people have benefited from an emergency vaccination campaign and more than 16 million messages containing health, shelter and sanitation information have been sent via blast SMS.

Courtesy: Christopher Cliffe, Australian Red Cross



Australian aid worker, Christopher Cliffe and his colleagues spent each day working through a steady stream of patients injured during the earthquake.

### Current focus

Although the humanitarian situation continues to improve on a daily basis, it is clear there are major unmet needs, particularly in terms of shelter and sanitation.

In the capital, tens of thousands of people are struggling in hundreds of makeshift camps. With the rainy season due to begin in May and the hurricane season in June, the situation is made more critical.

While the delivery and distribution of tents and shelter materials is being sped up, with more than 75 per cent of the displaced population having received shelter to date, the operation is severely constrained by the pre-existing shortage of land for new settlement. Work continues with Haitian authorities to identify additional appropriate sites for displaced people.

Of equal concern, Port-au-Prince was left without sanitation. So far more than 1200 latrines have been built in 20 different improvised camps, however more needs to be done before the rains hit. Aid workers are well aware that if conditions worsen, so too will the risk of potential epidemics of water-borne disease.

### Looking ahead

The recovery process will take years – perhaps even a generation – however aid workers are looking at this response as a rare opportunity to effect large-scale change where it is desperately needed.

Red Cross is committed to ensuring that Haiti’s devastated communities receive not only the help they need now, but the help they will need for a long while to come, with disaster response units now routinely including recovery experts to ensure community needs are understood and planned for. In addition, all work being undertaken by international aid workers is done in cooperation with Haitian Red Cross, with capacity development of the local society an ongoing focus for the global effort.

Longer term planning of recovery activities is well underway and will form the base upon which work will be implemented in the future.

Courtesy: Christopher Cliffe, Australian Red Cross



Christopher Cliffe and patients.

Courtesy: International Federation of Red Cross



Aerial shot of the German Red Cross hospital where Australian Red Cross aid workers have been stationed. This hospital was set up in a sports ground in Carrefour.

# A 'conceptual models' approach to organisational resilience

Gibson and Tarrant discuss the range of inter-dependant factors needed to manage organisational resilience.

## ABSTRACT

Over the last few years there has been considerable interest in the idea of resilience across all areas of society. Like any new area or field this has produced a vast array of definitions, processes, management systems and measurement tools which together have clouded the concept of resilience. Many of us have forgotten that ultimately resilience is not just about 'bouncing back from adversity' but is more broadly concerned with adaptive capacity and how we better understand and address uncertainty in our internal and external environments. The basis of organisational resilience is a fundamental understanding and treatment of risk, particularly non-routine or disruption-related risk.

This paper presents a number of conceptual models of organisational resilience that we have developed to demonstrate the range of inter-dependant factors that need to be considered in the management of such risk. These conceptual models illustrate that effective resilience is built upon a range of different strategies that enhance both 'hard' and 'soft' organisational capabilities. They emphasise the concept that there is no quick fix, no single process, management system or software application that will create resilience.

2001; Kates and Parris, 2003; Sornette, 2003; U.S.-Canada Power System Outage Task Force, 2004; United States General Accounting Office, 2004, McDonald and Robinson, 2009). Over the last decade, volatility in our natural, economic and social systems appears to be increasing at rates faster than many organisations can cope. Whilst such fast moving events overwhelm many organisations a proportion demonstrate an ability to either manage or bounce back from the adverse effects of system volatility.

In recent years the term resilience has been applied at individual, community, organisational, and societal scales to describe an ability to cope with often sudden and dramatic change (World Economic Forum, 2008; The Reform Institute, 2008). Accordingly, there have been a wide variety of resilience definitions, many reflecting the origins of the term from social, ecological, computing and engineering sciences (Holling, 2001; Paton and Johnson, 2001; Rose, 2004; Gaillard, 2007; Sapountzaki, 2007; Boshier et al, 2009, DeBardeleben, et al, 2009).

The term resilience has become widely used by many including consultants, managers, bureaucrats and politicians. With this increasing use of the term we have seen a catch-all terminology develop and some subsequent mismatches to our specific interest. Some of this has arisen from attempts to encapsulate a complex multidimensional, multifactorial concept under a single banner. Some blame must also lay with people jumping onto the bandwagon and trying re-badge old ideas. This has seen claims of processes, management systems, computer software and measurement tools that will all create resilience.

This paper aims to provide insight into the complexity and multidimensional nature of organisational resilience by examining several different conceptual models that demonstrate different and interrelated aspects of resilience. It is useful to remember the old saying "all models are wrong but some illustrate useful points." The authors have selected those models that we believe illustrate useful aspects of thinking about resilience. It is our hope that by considering resilience in its complexity, that we start to discard much of the simplistic and mechanistic approaches that are being promoted in recent years.

## Introduction

Today the majority of organisations have either been deliberately designed for, or have evolved to operate efficiently and effectively in routine environments characterised by stability and predictability. However, in many organisations, this has increased their vulnerability to the highly volatile and uncertain conditions that appear to be becoming the norm (Stern,

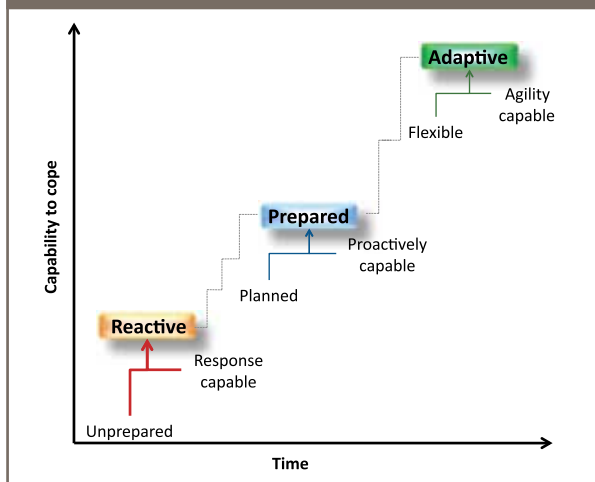


## The 'principles model of resilience'

The authors propose a 'principles model of resilience' that can provide a simple guiding foundation for investigating resilience. The principles model is derived from common themes that emerge from comparisons of resilience in different disciplines and is based upon six key principles:

- **Resilience is an outcome.** Resilience is not a process, management system, strategy or predictive measurement. It is most certainly not a synonym for business continuity or emergency management (although both of these can be important contributors to resilience). Rather resilience is a trait that can be observed following, and in response to a substantial change in circumstances.
- **Resilience is not a static trait.** There is no metric or score that will describe resilience as a fixed feature. An organisation's resilience will not be constant, but will change in response to volatility in the external environment and as organisational capabilities change over time. Resilience is dynamic, it will increase or decrease as the context changes.
- **Resilience is not a single trait.** Resilience arises from a complex interplay of many factors. As circumstances change, the presence, importance and contribution of each of these factors to resilience will change in turn.

FIGURE 1. The progression of resilience maturity.



- **Resilience is multidimensional.** There is currently no single model that describes resilience, all existing models have limitations, some more than others. The better models each describe aspects of resilience from complementary viewpoints.
- **Resilience exists over a range of conditions.** Resilience can exist over a range of conditions from low resilience (vulnerable) to high resilience (resilient). Such a spectrum of resilience can be observed amongst different organisations facing the same event; within a single organisation experiencing different types of events, or over different periods of time; or internally amongst the different functions within an organisation. As an organisation focuses on and invests in enhancing its resilience, it should see an increasing maturity in its resilience capabilities, from a low end highly

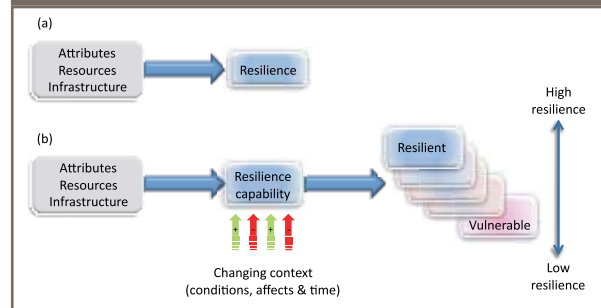
reactive state (such as a simple emergency response such as an evacuation), improving capabilities through proactive preparedness (for example having in place incident response and business continuity capabilities) eventually achieving a state where it is adaptive to conditions of high uncertainty (Figure 1).

- **Resilience is founded upon good risk management.** Rarely will organisations demonstrate resilience by accident. Their approach to developing resilience will be based upon the sound assessment, treatment and monitoring of, and communication about risk.

These principles establish a foundation upon which other conceptual resilience frameworks or models can be developed and evaluated. An immediate outcome of applying these principles demonstrates where many current resilience frameworks are flawed; in particular those static frameworks that also claim the ability to provide a measure of resilience.

Many existing approaches to measuring organisational resilience assume that measuring a range of organisational attributes in a routine environment, will translate directly to giving a measure of resilience (Figure 2a). However, in reality each attribute will potentially function differently and will have a different level of contribution to resilience, depending upon the conditions facing the organisation. Since resilience arises from an entity interacting with its environment, at best these models are measuring the organisation's resilience capabilities. It is the manner in which this range of resilience capabilities interact with a changing context that will determine an organisation's resilience (Figure 2b). An organisation's context may have both enhancing and degrading affects on these resilience capabilities resulting in a possible spectrum of outcomes – generating possibilities from high to low resilience. How the organisation deals with such variability in its context over time will depend upon how it monitors, understands and addresses the risks it faces.

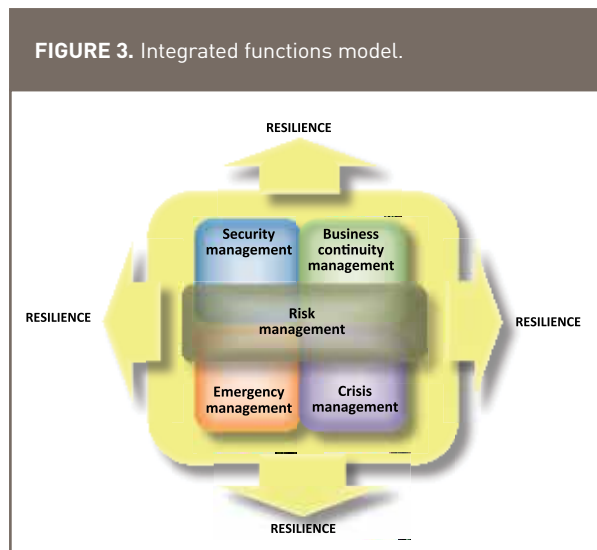
FIGURE 2. Comparison of (a) the more traditional static model of resilience with (b) the principles model of resilience.



Therefore, in the absence of a robust approach for modelling a dynamic range of different contexts, the best indication of resilience that we can hope for from models at this time will be an appreciation of the organisation's resilience capabilities.

## The 'integrated functions model' of resilience

Early concepts of organisational resilience, particularly from the UK and USA were based around re-badging various approaches to business continuity management (BCM) and relabelling them as resilience. This often presented us with what was labelled as a 'resilience process', or 'resilience system'. More recently there has been emergence of resilience management system cycles, apparently claiming to do for resilience what ISO9001 has done to quality assurance. Accordingly, we believe there is a danger that such highly prescriptive approaches not only fall short of what resilience is about, but that the prescriptive nature may even reduce resilience, particularly when faced with 'black swan' events (completely unanticipated, extreme consequence events). Over the last few years this has been demonstrated time and time again, when strongly prescriptive processes failed to adapt when the environment changed suddenly (Taleb, 2007) for example as occurred in the Enron Collapse (Committee on Energy and Natural Resources, United States Senate, 2002; Millon, 2003), Katrina (Walker, 2006) and the global financial crisis. This does not mean that all such approaches should be avoided.



An evolution of this process/management system thinking has seen a number of integrated models proposed, with some implemented successfully into a range of different organisations (including in the organisation of one of the authors). We believe that those integrated models that are based around a robust risk management program can be major contributors to organisational resilience. In such models, risk management provides the foundation that links different organisational capabilities such as emergency, business continuity, security and crisis management (Figure 3). Risk management provides a common understanding of how uncertainty arising from highly volatile environments can affect the organisation's objectives and provides the means by which these specialised capabilities can then address that uncertainty. However

while this may be a significant contributor to resilience it is not a complete picture.

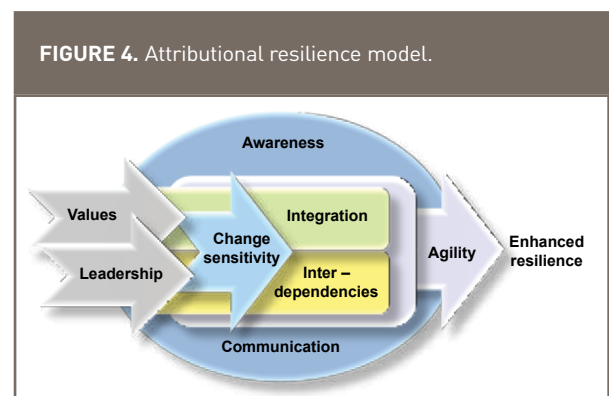
The current work undertaken by the joint Australia and New Zealand Standards working group has taken this concept to a whole new level into the development of the draft standard on *business continuity – managing disruption-related risk* (Standards Australia, 2009a), using the new risk management standard (Standards Australia, 2009b) as the driving concept.

## Attributional resilience model

Recent approaches have sought to explain resilience from the perspective of the features of highly resilient organisations. Such models demonstrate what organisational attributes can help an organisation deal with uncertainty and adversity. Accordingly, these models can provide an insight into the types of change that an organisation needs to consider making as it strives towards improving its resilience.

The 'attributional model' of resilience (Figure 4) was developed in a series of workshops by the Resilience Community of Interest (Resilience COI, 2009) is a good example of this approach. In this 'attributional model' the key drivers for creating resilience are:

- The organisational *values* - establishing commitment, trust and strong internal alignment and creating a common purpose.
- *Leadership* - establishing a clear strategic direction based upon an understanding of risk, empowering others to implement the strategic vision, and engendering trust.



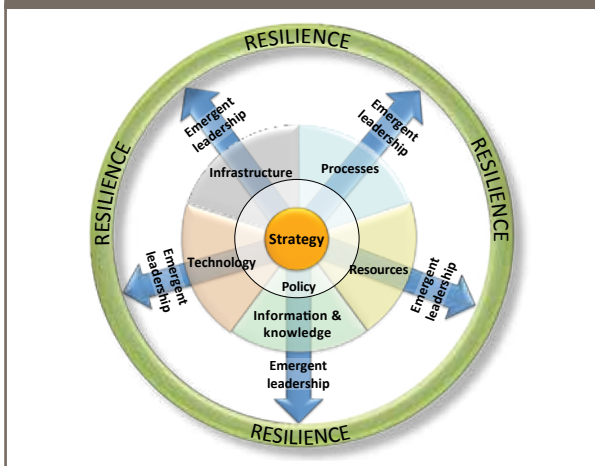
The 'values' and 'leadership' attributes in turn create an organisational culture and capability that is aware of, understands and is sensitive to internal and external change. This high level of *change sensitivity* or acuity (understanding the past, monitoring the present and foreshadowing the future) allows indicators to be identified in the lead-up to dramatic change. This in turn facilitates closer *integration* of the disparate parts of the organisation and through-chain *interdependencies*, enabling them to better work cooperatively together to a common set of goals a disruptive event unfolds.

The operation of these various elements is enabled through open, adequate and honest *communications* that both provides an understanding and creates an *awareness* of how risks to the organisation are emerging or changing. This awareness and communication enhances the organisation's ability to learn from previous disruptions and better understand and adapt to new emerging disruptions (Peche and Oakley, 2005). It is the manner in which these various elements interoperate that creates the *agility* that the organisation requires to respond and adapt to a volatile environment. Attributional models of this nature can be incredibly useful in focusing attention on these often poorly understood 'soft' elements of resilience.

### Composite resilience model

A drawback of the attributional models is the lack of attention paid to the 'harder' elements that contribute to resilience. The composite resilience model provides a different viewpoint that considers both soft and hard elements' operation: processes, infrastructure, technology, resources, information and knowledge. Key to the model is the central importance of strategy and policy in establishing an operational duality, the capability to operate in both routine and non-routine environments. However, one of the key differentiators of the composite model is the role of emergent leadership (Norhouse: 2000) (Mintzberg: 1985) in driving the adaptation of each of the other organisational elements to meet the changing non-routine environment.

FIGURE 5. Composite resilience model.



We envisage that emergent leadership is able to create an improved understanding of the volatile environment and any resulting changed organisational properties. Emergent leadership is therefore more rapid in translating this information into decisions and actions. It thus provides direction, in times of high uncertainty and ambiguity for applying capabilities and unifying the operation of the processes, resources, infrastructure, technology, information and knowledge. It also needs to be recognised that emergent leadership does not necessarily arise from top management, but often comes from talented middle managers that rise to the

occasion. This again emphasises the importance of strategy and policy in establishing the conditions that allow such leadership to emerge.

### Herringbone model of resilience

So with three different resilience models and three different viewpoints on resilience, which is the most appropriate? That really depends on how each model relates to an individual organisation's level of maturity and the context it operates within. To try and provide more of a one-stop shop model, the herringbone model was developed (Figure 6) to encapsulate the concepts of the other three models and fill in some of the gaps.

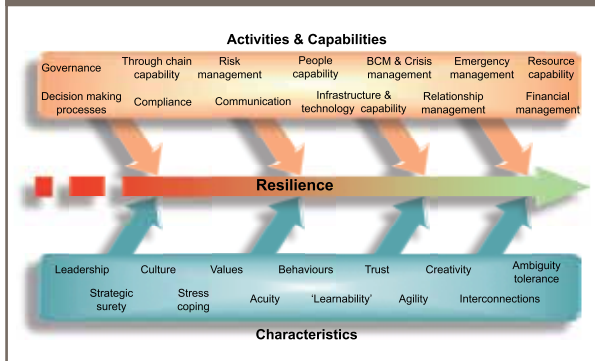
The 'herringbone' recognises that an organisation possesses a substantial range of *capabilities* and undertakes a range of *activities* (collectively what the organisation 'does') that will contribute towards improved resilience. Furthermore, the organisation also exhibits a number of *characteristics* ('how' the organisation operates), that will affect the effectiveness of the capabilities and activities and help to enhance the organisation's resilience.

Whilst most of the capabilities, activities and characteristics are critical to functioning in the routine environment, it is the manner in which they can adapt to the non-routine environment that will create resilience. A few capabilities and activities are specific for operations in the non-routine environment, such as business continuity, crisis and emergency management. However, there are some characteristics that really come into their own in helping to create a resilient state by helping all aspects of the organisation to better operate in a non-routine environment. Some of these critically important factors include:

- *Acuity* - the ability to recognise precedence - what has occurred in the past; situational awareness - what is happening now and foresight - understand what could happen in the future. Acuity provides the ability to take this information and identify early warning indicators of dramatic change and provides an understanding of possible options for dealing with it.
- *Ambiguity tolerance* - the ability to continue making decisions and taking action at times of high uncertainty.
- *Creativity and agility* - operating in novel ways to work around problems at a speed that matches volatility.
- *Stress coping* - that people, processes and infrastructure continue to operate under increasing demands and uncertainty.
- *Learnability* - the ability of the organisation to use the lessons of their own and others' experiences to better manage the prevailing circumstances, including using lessons in real time as they emerge.

The relative contribution and importance to resilience of each of the capabilities, activities and characteristics will depend upon the nature of the changing circumstances being faced by the organisation.

FIGURE 6. Herringbone resilience model.



### The resilience triangle model

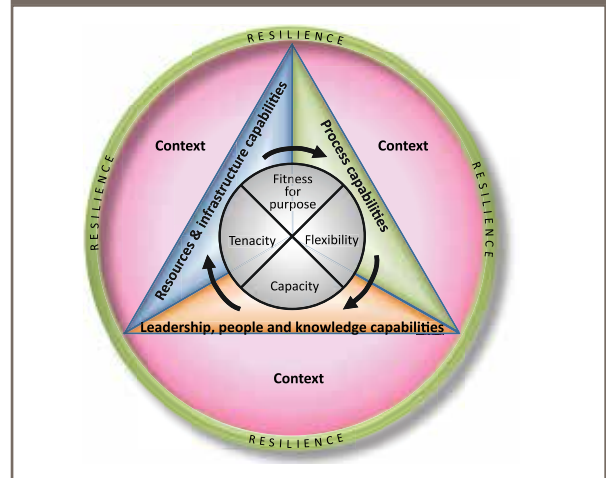
Collectively, the previous models demonstrate that resilience arises out of a complex interplay of organisational elements or capabilities that contribute to resilience when they adapt to a significant change. The challenge now is to encapsulate this complexity in a simple model construct.

The inspiration for us is the old fire triangle model (heat + fuel + oxygen = fire), take away any side of the triangle and the fire goes out. Hence the resilience triangle (Figure 7), take away any one side of the triangle and resilience 'goes out'. More accurately, what the model attempts to show is that all three types of capabilities: process capabilities; resources and infrastructure capabilities; and leadership, people and knowledge capabilities, are essential for organisational resilience.

The triangle model also emphasises the fluid nature of each of the three areas of capability. This fluidity arises from organisational processes that continually review, assess and adapt capabilities on each side of the triangle to ensure that they:

- Are *fit for purpose* – their design parameters meet the job that needs to be done – requires monitoring of capability and volatility.
- Retain sufficient *capacity* to ensure that required organisational objectives will be achieved – this often requires that the design of the capability has some level of redundancy.
- Have *tenacity* in that the capabilities continue to perform even in the face of severe disruptive consequence – requires that the design of these capabilities is either resistant or stress tolerant.
- Exhibit *flexibility* to go beyond original design parameters in response to changing circumstances.

FIGURE 7. The resilience triangle model.



Thus any loss of effectiveness of these capabilities (collectively or singly) will potentially degrade resilience. The actual extent of any degradation, or enhancement depends upon the nature of the interaction of the capabilities with each specific context (changing internal and external environment) being faced.

### Resilience strategies

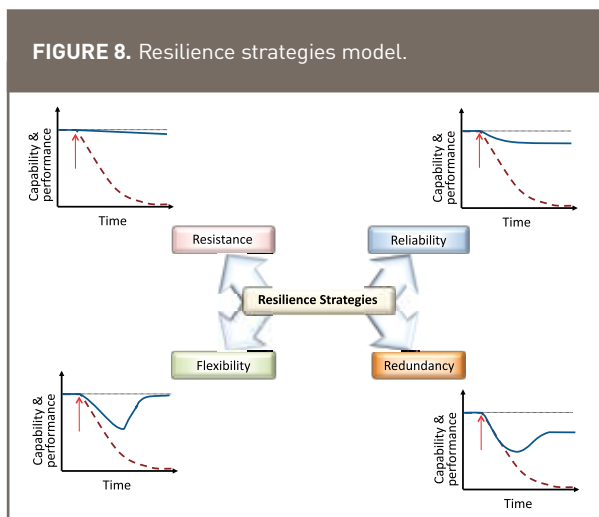
The range models in this paper illustrates a range of ideas about the nature of resilience. It has to be remembered that none of these models actually describe resilience itself. Rather they each describe some of those aspects of an organisation that can contribute to resilience. The question remains, however, of how these models can be implemented within an organisation. For any of the models there are four broad strategic approaches that can be taken to start building improved resilience: resistance, reliability, redundancy and flexibility.

It should be recognised that potentially any one of these four strategic approaches may provide for organisational resilience under specific set of circumstances. However, with a modern context that presents such high levels of uncertainty, it would be foolhardy to try to predict what is likely to happen and then be able to select a single strategic approach to manage those specific circumstances. It therefore seems more eminently sensible for an organisation to select a suite from all four types of strategies that will provide for a wide range of possible disruptions.

Each of the four types of strategies would be expected to influence the performance of organisational capability (and affect resilience) in a different manner (Figure 8). In the absence of any 'resilience strategies', organisational capability and performance (red dotted line, Figure 8) would be expected to show a sudden and catastrophic collapse soon after a disruptive event commenced (red arrow, Figure 8). However, the presence of one or more resilience strategies would be expected to moderate this deterioration in capability and performance (blue line, Figure 8) depending upon

the nature of the strategies in relation to the nature of the event. For example, generally we would expect to see the following:

*Resistance strategies* are aimed at improving robustness and hardening the organisation to withstand the immediate affects that volatility may impose. There is usually no agility or adaptation with such approaches, resistance tries to match the organisation's strength against the event's power. Following such an event, an effective resistance strategy would be expected to maintain capability and performance at close to routine operating levels. However, resistance strategies can present significant drawbacks as they are generally developed to meet predicted events, defined within expected parameters. Should the actual event exceed those parameters, then capability and performance would be expected to catastrophically collapse in the absence of other types of strategy. Examples of resistance strategies include: land use planning and construction standards in bushfire or flood prone areas; use of firewalls against cyber-attacks, etc. Also many organisational emergency response strategies can be regarded as resistance strategies.



*Reliability strategies* aim to ensure that key functions, resources, information and infrastructure continue to be available, accessible and fit for purpose following an event. Whilst capability and performance may show some deterioration, it is expected to remain at an acceptable level, until recovery is completed. Again, reliability strategies are usually designed to only operate within expected parameters, and should those parameters be exceeded then resilience can collapse suddenly and catastrophically. Outputs of reliability strategies would include arrangements such as business continuity plans, multiple supplier contracts, multimode systems, etc.

*Redundancy strategies* provide for one or more alternatives to day to day operational approaches. With redundancy strategies in place the organisation may have some initial degradation of capability and

performance before alternative arrangements begin to operate and re-establish performance back to acceptable levels. Redundancy strategies cater for arrangements such as disaster recovery plans, process work-arounds, back-up systems, etc. Such strategies are usually designed to manage foreseeable volatility and can be fragile in circumstances where their design parameters are exceeded.

Resistance, reliability and redundancy strategies generally provide for the process and 'hard factors' described by the various models.

*Flexibility strategies* enable the organisation to adapt to extreme circumstances and sudden shocks that often exceed the design parameters for the other strategies. Flexibility strategies usually provide for some of the 'soft' factors, particularly those in the 'composite', 'attributional', 'herringbone' and 'triangle' models. Such strategies, either directly or through their influence on resistance, reliability and redundancy provide the organisation with the adaptive capacity to respond to a wide range of unforeseen circumstances up to and including black swan events. Examples of such strategies include: training and exercising for extreme events, practising 'decision making in a vacuum'<sup>1</sup>, creating an environment for emergent leadership to flourish in, enhancing cultural aspects such as trust, loyalty and unified purpose.

## Conclusion

The models described in this paper describe both different and interrelated viewpoints of resilience. One other concept ties all resilience models together, the way in which the organisation approaches the management of disruption-related risk. Organisations that are striving for resilience have demonstrated their ability to better understand these risks as well as their own vulnerabilities. They have also shown their willingness to invest in risk treatments that have created adaptive capabilities to prevent, reduce, respond to and recover from the extremes of today's uncertainty. The application of tools such as the new risk management standard AS/NZS ISO31000 (Standards Australia 2009b) and the soon to be published AS/NZ 5050 will provide the foundation upon which better resilience can be built.

## References

**Bosher, L., Dainty A., Carrillo, P., Glass J., and Price A.D.F.**, 2009. Attaining improved resilience to floods: a proactive multi-stakeholder approach. *Disaster Prevention and Management. Vol. 18 No. 1, 2009 pp. 9-22.*

**Committee on Energy and Natural Resources, United States Senate**, 2002. Enron Corporation's Collapse. *Hearing before the Committee on Energy and Natural Resources United States Senate One Hundred Seventh Congress.*

<sup>1</sup> Decision-making in a vacuum, a key leadership skill in extreme events – being able to make rapid decisions and provide direction under conditions of high volatility and high ambiguity.

**DeBardeleben, N., Laros, J., Daly, J., Scott, S., Engelmann, C., Harrod, B.**, 2009. *High-End Computing Resilience: Analysis of Issues Facing the HEC Community and Path-Forward for Research and Development*. Whitepaper Sandia Laboratories. <http://www.csm.ornl.gov/~engelman/publications/debardeleben09high-end.pdf>

**Fiksel, J.**, 2003. Designing Resilient, Sustainable Systems. *Environmental Science and Technology* Vol. 37, No. 23, 2003 pp. 5330-5339.

**Gaillard, J-C.**, 2007. Resilience of traditional societies in facing natural hazards. *Disaster Prevention and Management* Vol. 16 No. 4, 2007 pp. 522-544.

**Holling, C. S.** *Understanding the Complexity of Economic, Ecological, and Social Systems*. *Ecosystems* 2001, Vol. 4, 390-405.

**Kates R.W and Thomas M. Parris T.M.** 2003. *Long-term trends and a sustainability transition—Proceedings of the National Academy of Sciences* vol. 100 no. 14 pp 8062–8067

**McDonald, L. and Robinson P.**, 2009. *A colossal failure of common sense*. Ebury Press, London.

**Millon D.**, 2003. *Who caused the Enron debacle?* *Washington and Lee Law Review*; Vol. 60 No.1 *Accounting and Tax Periodicals* pp. 309-330.

**Mintzberg, H. & Waters, J.** 1985 *Of Strategies, Deliberate and Emergent*. *Strategic Management Journal* Jul-Sep 1985; 6, 3;

**Northouse, P.** 2000 *Leadership: Theory and Practice* 2nd ed. Sage Publications

**Paton D. and Johnson D.** 2001. *Disaster and communities: vulnerability, preparedness and resilience*. *Disaster Prevention and Management* Vol 10 No 4 pp270-277.

**Pecche R.J. and Oakley K.E.** 2005. *Hormesis: an evolutionary "predict and prepare" survival mechanism*. *Leadership & Organisation Development Journal* Vol. 26 No. 8, 2005 pp. 673-687.

**Resilience COI**, *Report on the 2nd National Organisational Resilience Workshop 1-4 December 2008*. Published Sydney, February 2009.

**Rose A.**, 2004. *Defining and measuring economic resilience to disasters*. *Disaster Prevention and Management* Vol 13 · No 4 · 2004 · pp. 307-314.

**Sapountzaki K.**, 2007. *Social resilience to environmental risks: A mechanism of vulnerability transfer?* *Management of Environmental Quality: An International Journal* Vol. 18 No. 3, 2007 pp. 274-297.

**Sornette D.**, 2003. *Why Stock Markets Crash: Critical Events in Complex Financial Systems*. Princeton. Princeton University Press.

**Standards Australia** 2009a, *AS/NZS 5050 Business continuity: managing disruption related risk, published as the draft for public comments*.

**Standards Australia** 2009b, *AS/NZS ISO31000: 2009 Risk Management—Principles and Guidelines*.

**Stern N.**, 2001. *Finance for Growth: Policy Choices in a Volatile World*. World Bank, February 2001, Washington.

**Taleb N.N.**, 2007. *The Black Swan*. Allen Lane Publishing, London.

**The Reform Institute**, 2008, *Building a Resilient Nation: Enhancing Security, Ensuring a Strong Economy*. Published Washington, October 2008.

**United States General Accounting Office**, 2004. *Emerging Infectious Diseases: Asian SARS Outbreak Challenged International and National Responses*. Report to the Chairman, Subcommittee on Asia and the Pacific, Committee on International Relations, House of Representatives, April 2004, Washington.

**U.S.-Canada Power System Outage Task Force**, 2004. *Final Report on the August 14, 2003 Blackout in the United States and Canada: Causes and Recommendations*. Washington and Ottawa.

**Walker D.M.**, 2006. *Hurricane Katrina*. GAO's Preliminary Observations Regarding Preparedness, Response, and Recovery. United States Government Accountability Office Testimony before the Senate Homeland Security and Governmental Affairs Committee. March 2006.

**Woods D.**, 2003. *Creating Foresight: How Resilience Engineering Can Transform NASA's Approach to Risky Decision Making*. Testimony on The Future of NASA for Committee on Commerce, Science and Transportation, John McCain, Chair, October 29, 2003, Washington.

**World Economic Forum** 2008, *Building Resilience to Natural Disasters: A Framework for Private Sector Engagement*, January 2008, Geneva, Switzerland.

## About the authors

**Dr Carl A. Gibson** is the Director of the Risk Management Unit at La Trobe University at Bundoora, Victoria, Australia. He serves on a number of standards related committees for Standards Australia, ISO (TC23 –Societal Security), National Centre for Security Standards and the US National Fire Protection Association TC1600 (emergencies and business continuity). He has also served in a number of emergency management roles in army, police, government and corporate sectors and is currently a volunteer with the CFA.

**Michael Tarrant** is the Assistant Director, Research Management at the Australian Emergency Management Institute. He also holds adjunct appointments in the Department of Tropical Medicine at James Cook University and in the Public Health Faculty at Queensland University of Technology. He is a member of the Community of Interest for Organisational Resilience.

He has worked at a national level as a member of Standards Australia Risk Management Committee (OB-007) since 1998 and contributed to a wide range of associated handbooks.

# The organisation: Risk, resilience and governance

Tarrant argues that a solid risk management strategy is critical to building effective, transformational and adaptive organisations.

## ABSTRACT

**Organisations are a fundamental part of our society and economic system whether they are private, public or not-for-profits. There are very few aspects of our society and economy that don't rely wholly or in part on the performance of organisations. Disasters and crises are complex and very challenging environments for organisations. How can effective transformational and adaptive capacity become institutionalised and a core part of good governance of organisations? Effective risk management is a critical element in meeting organisational objectives in a turbulent and uncertain environment.**

## Introduction

Disasters and crises are complex and very challenging environments for organisations. Increasingly they are impacting on organisations' ability to achieve their objectives and the challenges are generating demands for new thinking about leading and managing. The research literature that provides insight to addressing these challenges is rapidly growing. Finding a way forward and meeting the challenges to organisations will require contributions and perspectives from a broad range of disciplines.

The release of the new risk management ISO is an opportunity to rethink how organisations can more effectively develop capability in the fields of activity described by such terms as risk management, business continuity, emergency management, crisis management, organisational resilience, continuity management, security management and disaster management. How can more effective approaches to leadership, management and governance be developed?

These fields have evolved over many years, often with little acknowledgement of the closely related and at times overlapping concepts and approaches to managing severe shocks. The use of language is

particularly challenging in an environment where disciplines and professions have developed their own concepts and lexicons to articulate their particular perspectives. Many individuals and organisations have invested heavily in particular approaches and hence are often very resistant to change.

The concept of resilience seems to offer an opportunity to move thinking forward. It is however currently suffering from fad status. Consequently it will take time to settle down into an effective and robust approach to enhance organisational performance in the face of a turbulent and uncertain environment.

Organisations are a fundamental part of our society and economic system whether they are private, public or not for profits. There are very few aspects of our society and economy that don't rely wholly or in part on the performance of organisations. They can range in size from several people through to thousands. An organisation is any entity with objectives. The dictionary definitions include "a body of persons organised for some end or work." The challenge is how do entities continue to meet their objectives when they are under acute stress or shock? Our society and economy are almost completely dependent on incredibly complex networks or webs of organisations. These networks and webs are both physical and relational and are continually evolving and are increasingly interdependent. How shocks play out in these systems is not well understood and traditional analytical approaches seem to have limited value. Successful outcomes will depend on an interplay between organisations from the private, public and not for profit sectors. How then can the effectiveness and efficiency with which organisations deal with the risk of a severe shock be developed and enhanced?

How then can approaches be developed to deliver better outcomes for our society? Are there themes and concepts which underpin or run through the relevant disciplines that might help enhance organisational coping and adaptation to shocks? What are the opportunities to enhance organisational performance and improve the potential for an organisation to survive a shock while continuing to achieve its aims and objectives whether in the public, private or not for profit sectors?

First line of the new ISO is an excellent starting point *“Organisations of all types and sizes face internal and external factors and influences that make it uncertain whether and when they will achieve their objectives. The effect this uncertainty has on an organisation’s objectives is “risk”. (AS/NZS ISO 31000:2009)* This statement is significant because it links risk and objectives. A large amount of managing risk is done intuitively. Individuals use resources to deal with situations and forces which would impact on them achieving objectives for which they are responsible or want to achieve. The new international risk management standard provides a set of principles, frameworks and processes to enhance the ways individuals and organisations manage risk.

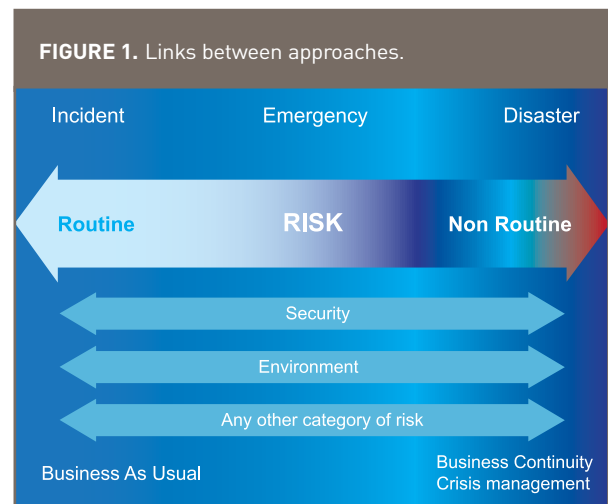
Once an entity consists of more than one individual the challenge lies in being able to effectively and efficiently manage the division of labour, so the organisation can achieve its objectives. As the organisation grows in size and complexity, an increasing proportion of available resources are needed to manage the contribution of individuals to achieve the organisation’s objectives. Objectives have to be broken or divided up into workloads for each person in the organisation to achieve. There have been many attempts over the past 50 years to minimize these overheads and to optimise resource use. This is not an argument against optimisation. It is a recognition that for most organisations it is no longer sufficient (Hamel and Valikangas 2003). A small percentage of the resource savings need to be reinvested in building the capacity of the organisation to cope with change, including shocks. Optimisation has been driven through a culture “where diligence, focus and exactitude are reinforced every day in organisations through training programs benchmarking improvement routines and measurement systems. But where is the reinforcement for strategic variety, wide scale experimentation and rapid resource redeployment?” (Hamel and Valikangas 2003:12) There have been significant gains in efficiency but this process may have generated a whole new set of risks. In recent years the rapid rise in interest in areas such resilience, risk management, governance and business continuity is evidence of these concerns.

The new ISO devotes a significant amount of space to frameworks for managing risk in organisations. The inclusion of principles and frameworks is a reflection of a growing maturity in managing risk and risk management is an essential part of good management practice. Risk and its management is an integral part of any decision or action, be it operational or strategic.

The question then arises: Can all risks be managed through the normal processes of the organisation? To state the obvious not all risks are the same, they have very different consequences and likelihoods of those consequences occurring. Some have limited effects where others can have catastrophic effects. The vast majority of risks have consequences which can and should be managed through routine processes in an organisation. However there are risks that cannot be managed in this way, the consequences are so great that business as usual is not a viable option. What approaches, structures and systems are needed to

manage this group or family of risks? To achieve their objectives under these conditions a management team may have to make very rapid changes to processes and functions in order to continue to be able to meet key objectives. This also applies to upside risk where explosive growth can be just as great a challenge to the organisation.

It is the changes in the organisation that defines the concept, risks described as non routine force changes which cannot be managed through business as usual approaches or existing policy settings. If the risk does not require this significant change then it should be handled through routine processes. Typically non routine risks are low probability that is they occur rarely or in some instances have never occurred but have very high consequences for the organisation. This can be represented graphically using a risk spectrum, see fig. 1. At one end are minor risks easily managed through routine processes often described as incidents; at the other end of the spectrum are catastrophic risks and there is a threshold along the spectrum between routine and non routine risk. The threshold is defined by changes in the organisation’s or system’s performance, not on absolute values. A situation in an isolated small organisation may force it into non routine activity, whereas the same event might be a minor incident in a large organisation and easily handled through routine processes.



Not all shocks are the same and people use terms interchangeably or with conflicting meanings. It is useful to separate the terms by using the organisational response to the situation rather than absolute numbers.

- An incident/emergency is usually a short term event requiring immediate predetermined actions by trained individuals with clearly defined roles. Some emergencies can be very big and testing but they do not require significant changes.
- A disaster is a longer term situation supported by planning and the co-ordinated execution of many interdependent activities often involving individuals working out of role.

Crisis is a very different challenge to an organisation. It does not help when the terms disaster, emergency and crisis are used interchangeably. Although clearly related, they are very different situations that prompt



different questions and thinking informed by different theories. (t'Hart & Boin 2006). A crisis is a serious threat to the fundamental values and norms of a system (or community)... "including widely shared values such as safety and security, welfare and health, integrity and fairness." (t'Hart 2006) Crises are characterised by ambiguity of cause, effect and means of resolution (Pearson & Clair 1998:60) and stakeholders often understand crises in different ways. It is the organisation's assumptions and understanding of its stakeholders' behaviour that shape the organisation's success in managing a crisis. (Alphaslan, Green & Mitroff 2009)

Both areas deal with events which are in the "un-ness" category. Unexpected, undesirable, unscheduled, unimaginable, uncertain and often unmanageable" (Hewitt 1983:p 10). Bernstein continues with the "un-ness" theme "many of these shifts may not have been unpredictable, but they were unthinkable" (Bernstein 1998:335). However not every crisis turns into a disaster but they do have the common characteristic of driving the organisation into non-routine activity.

What separates risk management in the non-routine context from the routine business practices? The non-routine part of the risk spectrum involves risks that have the potential to significantly alter the way an organisation operates until the situation is resolved. That is, to run in a non routine way or mode. That is why plans are developed and written. They are an attempt at a road map or guide for managers and staff on how to run an organisation in a very different environment that cannot be handled through normal processes and arrangements. One useful approach is to consider disasters as requiring very rapid change management to continue to achieve key objectives. To do this there may well have to be changes to the cascade of objectives through the organisation. Many middle and lower order objectives may need to be changed and significant shifts in the resources and processes to achieve the strategic objectives.

**Governance**

The rate of change in social, political, economic, technological and environmental dimensions of our world means we are facing more turbulent and uncertain times. The challenge is to drive an organisation forward while keeping it under prudent control (Garratt 2004). A small part of this process is building and maintaining the capability for the organisation to make very rapid changes in response to shocks but still deliver key objectives.

The OECD defines governance as "the system by which entities are directed and controlled"...and goes on to state "the structure through which the objectives of the company are set, and the means of attaining those objectives and monitoring performance are determined" Risk Management is a fundamental element of governance, that is the achievement of objectives. "Risk management should ensure that organisations have an appropriate response to the risks affecting them.

*Risk management should thus help avoid ineffective and inefficient responses to risk that can unnecessarily prevent legitimate activities and/or distort resource allocation". (AS/NZS ISO 3100:2009)*

Risk has to be managed to achieve any objective; from the board room to the mail room all people in an organisation have responsibilities and they have to manage risk to achieve those objectives. Whatever classification or terms used are to categorise risk (strategic, environmental, security or operational) do not really matter, the crucial concept, the risks people face, depends on the nature of their responsibilities and objectives they have to meet.

In most organisations, groups of individuals have to work collectively to achieve many objectives and managing risk should be no different. One key challenge is how, then, can collective action be reorganised so that objectives can continue to be met when the system has been affected by a non-routine risk or shock.



Diagram above outlines a generic governance framework (Garratt 2004). The term "the business" is used to describe what the organisation is trying to achieve or set up to do. While the diagram was originally designed for a private sector audience it is applicable to any reasonably sized organisation. There are two broad functions in any organisation and they are directing and operations. The "directors" chart the vision and mission of the organisation; they could be a board, minister, public representatives e.g. councillors etc. It is the function they perform that is important. This part of the organisation sets the direction and makes adjustments in response to changes in the internal and external environment they are therefore mainly involved in managing strategic risks. The executives and management team use resources to achieve the mission or vision of the organisation under the direction of the "Board". This part of the organisation can be described as operations. The two groups come together to develop strategy to ensure that the organisation can achieve its objectives.

Organisations have become very skilled at cascading the responsibility for the achievement of objectives from the board down to the shop floor. What organisations have not been good at is tying responsibility for

achieving objectives with responsibly for managing risk. *"To be effective within an organisation, risk management should be an integrated part of the organisation's overall governance, management, reporting processes, policies, philosophy and culture."* [AS/NZS ISO 31000:2009]

There has been a growing interest in the organisational response to non routine risk. Whether it is risk management, business continuity or crisis management, the emergence of interest in these fields is a good measure of increasing concerns in this area. The governance challenge is how to reconcile the divergence or lack of coherence between the fields that have evolved to deal with organisational response to risk of shocks. There appears to be little research about how these various perspectives can be integrated within an effective governance framework. This issue is rarely addressed in the organisational literature so carrying out research in this area will be very important.

### **The non routine environment and management**

There is a fundamental challenge for organisations in rapidly changing to fit a new environment and their core function. They were conceived primarily as devices for reducing uncertainty (Simon 1961 and March and Simon 1958) "They achieve this by creating zones of stability, structures that can maintain their identity over time in the face of external variations". (Boisot 2003:54). However if the external variation is a shock, then expecting organisations to seamlessly shift from one state to another, is at best problematic. If organisational survival depends on the rate of learning being greater than the rate of change in the environment, then a crisis or disaster with a very rapid rate of change and very compressed timeframe, can be very challenging. (Ashby 1958)

Non-routine risks generate conditions where numbers of people and organisations (some times large) have to work together in a non-routine way. In many cases they may not have even met each other before, much less be experienced in working together (Borodzicz 2005). The range of tasks, objectives and working environment may be substantially different from their normal workplace. "It is vital that the people involved in the response have received sufficient opportunity beforehand in the planning stage to form effective relationships with those people that the emergency will thrust together intra- and inter-organisationally". (Crichton, Ramsay and Kelly 2009:33).

The challenge is what organisational structures or system would be appropriate for an organisation that has to make very significant changes in the way it uses assets, people and other resources that is operate in a

non-routine way. Approaches such as Incident Control Systems (ICS) or Incident Management Systems (IMS) have been developed over many years in an attempt to address this challenge. The initial work on ICS was carried out by the fire services in the USA in the mid 1970's. Other variations include the Gold, Silver and Bronze system developed in England in 1985 when Scotland Yard realised that their usual rank system was inappropriate for sudden events. In this case the driver was the limitations of day to day or routine organisational structures to manage unfamiliar events. A detailed discussion of these systems is beyond this paper but interest in their effectiveness is growing. (Arbuthnot 2008) (Devitt and Borodzicz 2008) (Uhr Johansson and Fredholm 2008) (Webb and Neal 2006)

### **Conclusion**

The trends are clear, turbulence, complexity and uncertainty in our environment are only going to grow. Sentinels and researchers in many fields have clearly flagged the issue and enunciated many of the pressing challenges. At the heart of the problem is the organisation; the building block of our society and economy. How can sufficient learning and capacity-building keep up with change? How can effective transformational and adaptive capacity become institutionalised and a core part of good governance of organisations? (Podger 2004) (Kettl 2003) (Hamel 2003) (Garratt 2004). *"Taking this broader view which sees learning as a cultural activity of organisations helps us explore a less instrumental more reflexive aspect of institutional resilience in the face of the future."* (Turner and Pidgeon 1997:195). Learning and capability development are key themes that emerge from researchers and thinkers across this incredibly broad and diverse field, whether at individual, team or organisational levels.

## References

- Alphaslan, C., Green, S. & Mitroff, I.** (2009) *Corporate Governance in the context of Crisis*. *Journal of Contingencies and Crisis Management* vol 17 (1)
- Arbuthnot, K. A.** (2009) *Command Gap? Journal of Contingencies and Crisis Management* 16 (4) 186-194
- Ashby, W.R.** (1958) *Self regulation and Requisite variety in Introduction to Cybernetics* Wiley London.
- Bernstein, P.** (1998) *Against the Gods* Wiley New York
- Boin, A. 't Hart, P. Stern, E. Sundelius, B.** (2006) *The Politics of Crisis Management* Cambridge University Press Cambridge
- Boin, A. 't Hart, P.** (2006) *The Crisis Approach in* Rogriguez, H., Quarrantelli, E.L. and Dynes R.R. (Eds) *Handbook of Disaster Research*, New York, Springer.
- Boisot, M.** (2003) *Preparing for Turbulence: in* Garratt, B. (Ed) *Developing Strategic Thought*. London, Profile Books.
- Borodzicz, E.** (2005): *Risk, Crisis and Security Management* Chichester Wiley.
- Coles, E. Smith, D. & Tombs, S. Eds** (2000) *Conceptualising Issues of risk management within the 'Risk Society' Risk Management and Society*, Kluwer, Dordrecht.
- Crichton, M. Ramsay, C. and Kelly, T.** (2009) *Enhancing Organisational Resilience Through Emergency Planning* *Journal of Contingencies and Crisis Management* Vol 17 (1)
- Devitt, K. and Borodzicz, E.** (2008) *Interwoven Leadership: the missing link in Multi-Agency Response* *Journal of Contingencies and Crisis Management* Vol 16 (4)
- Drennan, L.T. McConnell, A.** (2007) *Risk and crisis management in the public Sector* Routledge. New York.
- Garratt, B.** (1999) *The learning organisation 15 years on some personal reflections*. *The Learning Organisation*. Vol 6 (5)
- Garratt, B.** (2003) (Ed) *Developing strategic thought*, London Profile Books
- Garratt, B.** (2006) *Thin on Top: Why Corporate Governance Matters* Nickolas Breatley London
- Hamel, G. Valikangas, L.** (2003) *The Quest for Resilience* *Harvard Business Review* Sept 2003
- Hewitt, K.** (1983) (ed). *Interpretations of calamity* London Allen and Unwin
- Kasperson, R.** (1992) *The Social Amplification of Risk*. in Krimsky, S and D. Golding (1992). (eds) *Social Theories of Risk*. Westport Praeger
- Kettl** (2003). *The Future of Public Administration Report of the Special NASPAA/American Political Science Association Task Force*.
- Kreps, G. and Bosworth** (2006) *Organisational Adaptation to Disaster in* Rogriguez, H., Quarrantelli, E.L. and Dynes R.R. (Eds) *Handbook of Disaster Research* Springer, New York, pp 295-315
- Lagadec**: (1997) *Learning processes for Crisis management in complex organisations* *Journal of Contingencies and Crisis Management* 5 (1) 24-31
- Neal, D. M. and Webb, G. R.** (2006) *Structural Barriers to Implementing the National Incident Management System during the Response to Hurricane Katrina* [http://www.colorado.edu/hazards/publications/sp/sp40/katrina\\_TOC.pdf](http://www.colorado.edu/hazards/publications/sp/sp40/katrina_TOC.pdf)
- Pearson, C.M. & Clair, J.A.** (1998) *Reframing Crisis Management* *Academy of Management Review* Vol 23 (1)
- Podger, A.** (2004) *Innovation with integrity – the public sector leadership imperative to 2020*. *Australian Journal of public administration* 63 (1)
- Simon, H** (1961) *Administrative Behaviour*. New York Macmillian.
- Smithson, M.** (1991). *Managing in the Age of Ignorance New Perspectives on Uncertainty and Risk* Canberra CRES/NDO.
- Turner, B. and Pidgeon, N.** 1997 *Man made disasters*. London Wykeham
- Uhr, C. Johansson, H. and Fredholm, L** (2008) *Analysing Emergency Response Systems* *Journal of Contingencies and Crisis Management* 16 (2)

### About the author

**Michael Tarrant** is the Assistant Director, Research Management at the Australian Emergency Management Institute. He also holds adjunct appointments in the Department of Tropical Medicine at James Cook University and in the Public Health Faculty at Queensland University of Technology. He is a member of the Community of Interest for Organisational Resilience.

He has worked at a national level as member of Standards Australia Risk Management Committee (OB-007) since 1998 and contributed to wide range of associated handbooks.



# Organisational Resilience

Parsons argues that a modern organisation's ability to survive and prosper against the flow-on effects of natural disasters will depend on its resilience capacity.

## ABSTRACT

**Traditional risk management and business continuity management practices are well suited to meeting the challenges of foreseeable risk. In a rapidly changing world, organisations may be subject to natural disasters, widespread and sustained critical infrastructure disruptions and the impacts of international supply chain disruptions. These threats can exceed the scale foreseen and planned for by an organisation. The ability to survive and take advantage of these events depends on the resilience capacity of the organisation. An organisation wishing to survive and prosper from adversity could optimise its opportunity by enhancing its resilience attributes in preparation for such events.**

## Introduction

Resilience is often described as the capability of an organisation to minimise the impact of severe disruption events on the organisation's objectives, the ability to "bounce back". However there are many organisations that have experienced adversity and used the event as an opportunity to improve the organisation's prospects. This could mean improving market share, reputation or staff morale and reducing the requirement for government intervention and increased regulation. A highly resilient organisation could use severe disruptive events as an opportunity to slingshot the organisation forward. This was demonstrated by Nokia in March 2000 when they experienced a supply chain disruption. The supply chain also provided product to their competitor Ericsson. Nokia effectively used the event to significantly increase their share of the mobile telephone market. (Sheffi 2005). The US Competitiveness Council describes resilience as "the capacity for complex systems to survive, adapt, evolve and grow in the face of turbulent change. The resilient organisation is risk intelligent flexible and agile". (Opstal 2007).

The report from a workshop conducted by the Trusted Information Sharing Network's Community of Interest

describes eight key attributes of resilient organisations. (Parsons 2007). These attributes are awareness, agility and flexibility, change readiness, interdependency knowledge, integration, culture and values, leadership and communications. In times of adversity these attributes enable an organisation to effectively:

- anticipate and understand emerging threats
- understand the impact of threats on the organisation, supply chain, the community in which it operates and upon the lives of staff
- develop and maintain supportive partnerships with critical stakeholders in their supply chain, sector and community
- respond, recover and grow from disruptions as a unified whole of organisation team
- adapt to disruption and react flexibly to restore and improve functioning and strengthen the organisation
- ensure staff are willing and able to support the organisation to achieve organisational objectives
- articulate clear organisational objectives and establish a strong sense of purpose in response to, recovery and growth from a disruption
- lead with clear direction while enabling devolved problem solving.

The resilience attributes identified by the Trusted Information Sharing Network's Community of Interest in their 2007 report are described below.

The awareness attribute enables anticipation and understanding of emerging threats, enables organisations to know their own, their staff and their supply chain's vulnerabilities and the tipping points that would be irreversible if they were reached. An aware organisation would consider severe case disruption scenarios stretching the imagination of staff. An aware organisation has the knowledge to identify and interpret weak signals that enable the early identification of developing risks. The development of sentinel capabilities in an organisation is critical for effective awareness.

Agility and flexibility would be built through considering 'what if' scenarios, learning from events experienced by other organisations, preparing and practicing response and recovery strategies as well as developing problem solving skills, adaptive thinking and work a rounds.

Change readiness in organisations can be increased by considering what their future business may look like

and considering how events could be used to enable change. To be ready for change research is needed to investigate new technologies and approaches. There needs to be a level of opportunistic readiness.

Interdependency knowledge ensures the organisation has trusted relationships with stakeholders, regulators and suppliers. Organisations strong in this attribute develop mutual aid arrangements with industry peers and neighbours. The dependency on staff is clearly understood and arrangements are in place to ensure all staff can support the organisation achieve its objectives during adversity.

Teamwork and the avoidance of silo-ism is important in an organisation trying to ensure an integrated and seamless response, recovery and growth operation. Information and resources need to flow across the organisation, suppliers and contractors. The organisation needs to work together before the event achieving awareness and effective preparedness.

Culture and values is one of the most important organisational attributes in achieving resilience. An organisation under great stress needs to have a strong unity of purpose. Staff need to have a "one in all in" approach with a strong team spirit and will to succeed and beat the odds. A resilient organisation would have an enthusiasm for challenge and see a crisis as an opportunity. The staff would have high levels of morale and personal resilience. The importance of shared beliefs and values would be critical.

Leadership during complex times of uncertainty is required to set clear goals and enable devolved decision making and problem solving. To achieve this goal staff must feel empowered to make the required decisions by having clear delegation and objectives to be achieved. Leaders need to be able to adapt leadership styles to

the situation at hand. A core role of leadership is to build hope and optimism amongst staff.

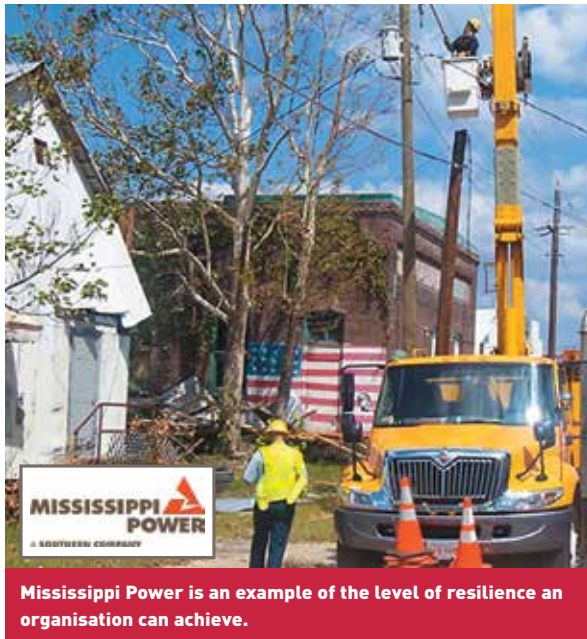
Last but not least is the need for the communication of information between all stakeholders. Information needs to be communicated rapidly and accurately. Communication channels need to be accessible by all those involved in the operation as required and understood by all participants.

All the above attributes in turn need to be applied to an organisation's policies, procedures, people, assets and infrastructure, contractors and technology systems.

Fiksel (2003) talks of creating "inherent resilience by designing in diversity, efficiency, adaptability and cohesion." While Starr, Newrock & Delaney. (2007) state "a resilient organisation effectively aligns its strategy, operations, management systems, governance structure and decision support capabilities so that it can uncover and adjust to continually changing risks, endure disruptions to its primary earnings drivers, and create advantages over less adaptive competitors"

The concept of resilience is very difficult to incorporate into a plan or checklist. Resilience is the outcome from undertaking many activities in an organisation. These activities can include human resource practices, business continuity planning, strategic planning, risk management, asset design, internal communications and relationship management to name just a few. Resilience is the output from the combination of all this efforts and should be seen as an underpinning objective similar to sustainability and corporate social responsibility. Dr Erica Seville (2008) states "Resilience is not something you do .....it is something you are."





An example of the level of resilience an organisation can achieve is that of Mississippi Power. Mississippi Power supplies electricity to the Gulf Coast and was severely impacted by Hurricane Katrina. Mississippi's Power's corporate motto is "Always on" a simple statement they practice everyday that is well known to staff. Mississippi Power had a workforce of 1,250 employees at the time of Hurricane Katrina. After the hurricane Mississippi Power deployed 11,000 additional workers from across North America. This enabled them to repair their severely damaged system and restore services to all customers in 12 days. All staff returned to work even though many had no homes to return to. Mississippi Power had a "one in all in" culture with strong family support. Even though many staff had lost their homes they returned to work to be part of the team. Existing plans were well rehearsed and flexible enough to stretch to double their planned levels. Staff were empowered to make decisions and lead at all levels within the organisation. Strong community links were in place.

Starr, Newfrock, Delaney (2007) say that "resilient organisations are sensing, agile, networked, prepared, consider outrageous possibilities, learning how to survive before the fact". The challenge is building this capability within our organisations.

Charles Darwin said, "It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is the most adaptable to change." He also said, "In the long history of humankind (and animal kind too) it is those who have learned to collaborate and improvise most effectively that have prevailed."

## References

**Blythe, B** (2002), *Blindsided*, Penguin Group, New York.

**Hamel, G & Välikangas, L** (September 2003) *The Quest for Resilience*, *Harvard Business Review*.

**Fiksel, J** (2003), *Sustainability and resilience; toward a systems approach*, *Journal of Sustainability: Science, Practice, & Policy*. Vol 2, Issues 2.

**Kendra, J & Wachtendorf, T** (2001) *Elements of Community Resilience in the World Trade Centre Attack*, *University of Delaware Disaster Research Centre*.

**Opstal, D** (2007), *Transform*, Council on Competitiveness, Washington.

**Parsons, D** (2007), *Organisational Resilience Workshop Report*, Resilience Community of Interest, Mt Macedon.

**Sheffi, Y** (2005), *The Resilient Enterprise*, MIT Press, Massachusetts.

**Starr, R, Newfrock, J & Delurey M.** *Enterprise Resilience: Managing Risk in the Networked Economy*, <http://www.strategy-business.com/press/16635507/8375>

### US Council on Competitiveness

[www.compete.org](http://www.compete.org)

### Resilient Organisations – University of Canterbury

[www.resorgs.org.nz](http://www.resorgs.org.nz)

### 2010 Global Risk Report

[www.weforum.org](http://www.weforum.org)

## About the author

**David Parsons** is the Chair of the Organisational Resilience Community of Interest, Manager of the Emergency Management & Security Unit, Sydney Water and Chair of the Water Services Infrastructure Assurance Advisory Group. He may be contacted on [dtparsons@bigpond.com](mailto:dtparsons@bigpond.com)

R

# Resilience and risk management

**Dahms argues that compliance against a universal set of rules reduces resilience.**

**PAPER ORIGINALLY PRESENTED AT THE 2009 EMERGENCY MANAGEMENT PUBLIC AFFAIRS CONFERENCE**

## ABSTRACT

**This paper does not support the widely held view that the recent global financial crisis was caused by a failure of conventional risk management and that risk management be replaced by a new process called 'organisational resilience'. It argues that the failure is one of implementation, not the risk management process itself. Further, using complex adaptive theory the paper demonstrates that resilience and sound corporate governance are states of being resulting from the effective management of risk as set out in ISO 31000:2009, not processes. This paper is a revised extract from Dahms 2009<sup>1</sup>.**

Underpinning these issues is the reliance, at least in the United States, on guidance from the Committee of Sponsoring Organizations of the Treadway Commission's (COSO) ERM Framework<sup>2</sup>. The shortcomings of COSO ERM include its: size and lack of clarity; focus on negative impacts, internal control and compliance, mostly financial; focus on reporting risks rather than managing them; and lack of practical guidance for implementation of an effective system of risk management<sup>3</sup>.

All of the above indicate that risk management as a concept has been profoundly misunderstood and misapplied rather than any failure of the concept itself. The current push by some for organisational resilience to replace risk management compounds this problem, and relies on an inaccurate definition of resilience.

This paper takes the view that any organisation with effective risk management practices will also have sound governance and be resilient.

In the following discussion where the word board is used it is meant as the governing body, which can be any private sector company board, a university council, a local government council, a statutory body board, a single person in charge of a public sector department and so on.

## Paradigms

The paper sets out 8 paradigms. In the first, complex adaptive theory is borrowed from evolutionary biology to present a definition of resilience that sees it as a state of being rather than a process. The paradigms that follow illustrate how risk management may be integrated and leveraged to achieve resilience. The clear message from the paradigms is that compliance with a set of rules will not deliver sound governance and resilience, and that everything is interconnected in a constantly changing environment.

## Resilience

Resilience expresses the capability of an organisation or its parts to respond quickly to uncertainty. The following paradigm examines the complex nature of uncertainty, and the reasons driving this complexity, to form a new definition of resilience.

## Introduction

Much public analysis and finger pointing has occurred in an attempt to identify the triggers for the recent global financial crisis. Two related but incorrect assertions have emerged from this process. One is that conventional risk management has failed. The second is that organisational resilience, supported by corporate governance and risk management, is the new assurance process for promoting business success.

It is clear from a majority of the public analysis that the causes of the global financial crisis are complex. Those relevant to this paper include failures in legislation, regulation and governance practices. Running through all of these issues is the failure to understand and apply sound risk management principles by legislators, regulators and those elected or paid handsomely to know better. Distillation of the public analysis provides a number of examples to support this view.

The focus of risk management was on funding risks rather than managing them. There was an increased reliance on computer modelling without sufficient attention to past events, the value of human judgement or allowance for future events. In some cases those charged with making critical decisions unquestioningly relied on the judgement of rating agencies, thus abrogating their fiduciary obligations.

**Paradigm 1: Resilience is a destination not a journey.**

The claim that organisational resilience, supported by corporate governance and risk management, is the new assurance process for promoting business success is incorrect on two counts.

In the first instance resilience is a state of being arising from activities to address uncertainty. The process for addressing uncertainty is risk management as outlined by ISO 31000:2009. The key to understanding this proposition is the complex nature of uncertainty.

Uncertainty has a number of aspects. It is possible to anticipate some elements of uncertainty when developing risk registers against objectives. There remains uncertainty in the form of unexpected events that are either threats or opportunities, both having an upside and a down side. However, even those elements of uncertainty that can be anticipated are in themselves subject to uncertainty due to the complexity of relationships within and without an organisation, i.e. organisations operate in complex adaptive systems.

The literature and discussions on resilience tend to be linked with disasters and crisis management<sup>4</sup> i.e. unpredictable, low likelihood, high consequence risks and is more akin to business continuity and disaster management. However, the definition of resilience has a much broader intent —

*The adaptive capacity of an organisation in a complex and changing environment<sup>5</sup>.*

This definition remains incomplete and a more informative definition of resilience, proposed in this paper, would be —

*Resilience is an organisation's state of being resulting from the management of uncertainty in a complex adaptive system. An indicator of this state of being is an organisation's adaptive capacity.*

The implication from this definition is that resilience is the outcome of the risk management process, i.e. managing uncertainty.

Complex adaptive system theory (evolutionary theory) was developed in biology, but has application to organisations. It is currently being applied to economic theory and is the subject of book by Eric Beinhocker<sup>6</sup> in which he says on page 187,

*... evolution is a general-purpose and highly powerful recipe for finding innovative solutions to complex problems. It is a learning algorithm that adapts to changing environments and accumulates knowledge over time.*

In contrast, there are contemporary views of corporate governance and risk management that mirror the earlier scientific view of the world as a linear space where the simple rules of cause and effect apply. In this space the universe and its parts (systems) were viewed as machines and it was thought that by understanding their component parts they would understand the whole. Additionally, by improving the performance of the parts they could improve the performance of the whole. This approach failed to achieve results and it became apparent that the systems were behaving according to



Resilience relies upon the ability of an organisation to anticipate and manage uncertainty.



a different set of rules. This set of rules is defined by complexity theory, which is

*...based upon relationships, emergence, patterns and iterations. A theory that maintains the universe is full of systems, weather systems, immune systems, social systems etc and that these systems are complex and constantly adapting to their environment. Hence complex adaptive systems<sup>7</sup>.*

A fuller discussion of the elements of complex adaptive theory is beyond the scope of this paper, but a concise account is given by Fryer (2009)<sup>8</sup>. Broadly speaking, organisations and parts thereof do not exist in isolation, but are part of an interconnected set of systems which are informed by feedback mechanisms. Such systems are aware or alert and learn by accumulating knowledge over time.

It follows that any conceptual view of governance, risk management and resilience that relies on linear theory is seriously unreliable. Compounding this is the application of tick and flick compliance programs to the linear theory. Certainly any system that restricts its view of control to internal financial control would be so woefully inadequate in addressing uncertainty as to be negligent (Paradigm 7).

In the second instance the process of corporate governance is risk management (Paradigm 8) and therefore resilience is the outcome of governance, not the reverse.

Achieving resilience is reliant upon the ability of an organisation to anticipate and manage uncertainty. The conceptual foundation for this rests on an awareness of the organisation's operating environment and its connections within that environment. Awareness is facilitated by: the effective integration of risk management; adopting a broad view of control; and developing an understanding corporate governance processes. The following paradigms address these matters and their underlying concepts.

### **Paradigm 2: Strategic plans and competitive advantage are transitory.**

The intent of strategic plans is to present a blue print for an organisation's direction and competitive advantage over a five year period. However, the dynamic complexity of the environment renders them transitory and in constant need of renewal.

A new approach is required. Rather than trying to predict the future by developing a single strategic plan, it is more effective to build a set of competing business plans around the strategic plan that reflect the competition occurring outside in the market place. By creating options and keeping the tree of possibilities as bushy as possible an organisation can evolve into the future<sup>9</sup>.

In concert with this new planning process is the development of what Beinhocker calls "prepared minds". This sees planning as a learning exercise preparing people for the future rather developing an answer in the form of a single, focused five year plan based upon predictions of the future. Its process involves robust

analysis and debate around facts and environmental issues rather than opinions. The outcome from these new approaches to planning is awareness.

This is a leadership issue that provides resilience, variously referred to as adaptability or agility in resilience literature, at the head of the organisation. The creation of alternatives and developing "prepared minds" cascades throughout the organisation in the planning process creating an aware and resilient organisation.

## **Integration of risk management**

Many recent initiatives have been aimed at making risk management a more integrated process. The iterations are variously labelled Enterprise Risk Management (ERM) and Enterprise Wide Risk Management. In the case of many organisations, particularly those that favoured the COSO ERM Framework, it has not proven to achieve full integration mostly because risk management has remained a discrete exercise without clear integration as part of normal business practice. Managers have therefore seen it as an additional financial and operational impost, which is not balanced by practical benefits.

The key to breaking this resistance is a set of paradigms that illustrate not only the intuitive nature of risk management, but also that effective risk management delivers cost effective performance, resilience and competitive advantage using existing business systems.

### **Paradigm 3: Risk is part of each objective**

The aim of risk management is not the management of risk per se but the achievement of objectives, i.e. risk is part of each objective at all levels of the organisation. The linkage between risk and objectives is reflected in the definition of risk as – the effect of uncertainty on objectives (ISO 31000: 2009). This is the foundation paradigm from which all the others flow.

### **Paradigm 4: Uncertainty is an all encompassing concept**

The current risk management landscape is fragmented by several standards and professional specialist areas such as Compliance, Business Continuity/Disaster Management, Security, Safety, Sustainable Development and Resilience.

By embracing the simple concept in Paradigm 3, risks and their treatments (which are also controls and strategies: Paradigm 6) cascade throughout the organisation with objectives and with the appropriate language for each level. This develops an integrated system and supports the view that none of the parts operate in isolation (complex adaptive systems theory). This also means that other management processes that focus on a particular type of risk such as Compliance, Business Continuity/Disaster Management, Security, Safety and Sustainable Development cascade throughout the organisation along with other risk areas such as finance, IT, HR etc and their focus is on achieving objectives.

The logical inference therefore is that there need only be one standard dealing with the management of risk and that is ISO 31000:2009 which covers uncertainty, i.e. all forms of risk. Specialist areas such as Compliance, Security, Safety etc would be best accommodated as supporting handbooks that deal with the application of the general risk management process to particular types of risk. This does not infer any reduced importance to these issues, but connects them under the uncertainty umbrella and with each other, while continuing to recognise the distinctive nature of their risks and strategies.

**Paradigm 5: The management of risk is an intuitive process**

Managing risk is an uncomplicated process used in everyday life to achieve objectives. Examples include getting to work on time and safely, meeting appointments and deadlines, driving, crossing the road and so on. The processes of setting the objective, identifying and understanding the risk and developing strategies (risk treatments) to achieve the objective are intuitive and occur unconsciously as part of normal activities. The focus is on the objectives and the strategies to achieve them, not the risks.

In contrast, some organisations have implemented an ERM process by developing a separate, resource-hungry risk management framework focused on the risks with tenuous linkages if any to objectives and strategies. This type of ERM process therefore unnecessarily duplicates the intuitive risk management activities in the standard business practices of planning and performance monitoring and works against resilience (Paradigm 6).

**Paradigm 6: Risk management, planning and performance review are concomitant processes.**

By applying the risk management process to objectives, risk treatments are at the same time controls and strategies. Consider that the objective is to cross the road and the risk is identified as being hit by a moving vehicle.

Assessment of the risk is a combination of likelihood of the event occurring and the consequence should the event occur. The consequences of being hit by a moving vehicle are assessed as high; the level of likelihood varies depending upon the density of the traffic as follows —

- If the traffic is light, the likelihood of significant consequences is assessed as low and the residual risk is rated as low. The action is to look right, left and right again and then proceed to cross the road when a safe gap in the traffic appears.
- If the traffic is heavy, the likelihood of significant consequences is assessed as high and the risk is rated as high. The action is to proceed down the footpath to a traffic light and push the "WALK" button. The traffic is stopped at a red light reducing the risk to an acceptable level allowing the road to be crossed safely.
- The act of looking right, left and right again or the pushing of a "WALK" button are risk treatment plans that reduce risk to an acceptable level allowing the objective to be achieved. The treatment plan is changed depending on the level of risk. The risk treatments are at the same time controls designed to ensure the objective will be achieved and also strategies for achieving the objective, i.e. risk treatment plans are controls and also strategies.



Boards or Senior Management can set discretionary rules that govern an organisation's size, purpose and operating environment.

- A number of significant outcomes arise from the above paradigms.
- the risk management process is effectively integrated throughout the organisation with objectives;
- responsibility and resources for the management of uncertainty can be clearly assigned thereby facilitating the assurance processes for accountability;
- risk registers arranged by objectives transform risk information into knowledge;
- resources used in duplicating the process as a separate compliance exercise can be redirected to more effective uses;
- the compilation and review of risk registers become part of the planning process;
- performance reviews against key performance indicators provide a real-time review of the effectiveness of the risk management system; and
- capability and commitment for the management of uncertainty are enhanced throughout the organisation (builds awareness and supports resilience).

### **Paradigm 7: Control is a broad concept.**

The restrictive concept of internal financial control outlined in COSO ERM Framework and the ASX Corporate governance Council's Supplementary Guidance to Principle 7 (Risk Management)<sup>10</sup> ceased to be the overarching view of control more than a decade ago. This restricted view of control ignores significant non-financial and external risks and appreciably reduces resilience.

A more inclusive concept of control covers all activities after the strategic direction has been set and it includes external as well as internal factors. Control is defined as follows —

*Control comprises those elements of an organisation (including its resources, systems, processes, culture, structure and tasks) that, taken together, support people in the achievement of the organisation's objectives<sup>11</sup>.*

This broader concept acknowledges that organisations operate in complex dynamic systems (Paradigm 1).

## **Risk and governance**

Corporate governance is all about control assurance, which in turn is reliant on the effective management of uncertainty. The following paradigm develops the theme that risk management is the process of corporate governance, and examines how this relationship can be leveraged to promote resilience.

### **Paradigm 8: Corporate governance is an organisation's strategic response to uncertainty.**

Dahms (2008)<sup>12</sup> clarified this concept by arguing that corporate governance is in essence risk management on the premise that corporate governance is essentially a set of common management practices

that address higher level risks. These management practices include: strategic and operational planning; designing the corporate structure and populating this with capable and committed people; matching responsibility with authority and resources; setting the ethical standards; implementing a quality information system; monitoring performance, compliance and the operating environment; and finally reporting to provide accountability and assurance.

The management practices are in essence high level control activities addressing high level risks and can be universally applied to any organisation. Addressing control activities to develop capable and committed Directors, senior officers and employees who have a clear understanding of organisational and personal purpose establishes inherent controls. Because inherent controls are developed by refining and aligning existing management practices, their implementation is both uncomplicated and cost effective. For the same reason inherent controls are proactive, self sustaining, and promote awareness and resilience.

## **Conclusion**

Risk management as outlined in ISO 31000:2009 is the process for managing uncertainty and achieving objectives.

Uncertainty, and its relationship to the achievement of objectives, is the concept linking risk management, corporate governance and resilience. In essence, an organisation that effectively manages uncertainty will also have sound governance and be resilient.

Resilience is the ability of an organisation to anticipate and respond to uncertainty in a complex adaptive environment, i.e. its adaptive capacity. It is a state of being or outcome and the underlying process is risk management.

It is clear therefore that just relying on a new, repackaged process called 'organisational resilience' will not address the fundamental problems that caused risk management to fail in so many organisations. None of these failures relate to the nature of the risk management process; all relate to how it was implemented and integrated into decision making.

The development of a resilient organisation therefore requires that —

- The conventional linear, compliance method for addressing the management of uncertainty and corporate governance be abandoned in favour of complex adaptive theory, which more accurately reflects the nature of an organisation's operating environment.
- A simple change in the focus of risk management from the management of risk to the achievement of objectives be adopted. This change not only terminates the silo treatment of risk management within the organisation, but also the silo stratification of risks into strategic and operational. Carrying this one step further it brings Compliance, Business

Continuity/Disaster Management, Security, Safety and Sustainable Development under the uncertainty umbrella. Removal of all the silos mentioned above develops connections, promotes synergy and enhances resilience.

### About the author

**Dr. Ted Dahms** has been reviewing governance and risk management systems since 1989 as a Queensland Audit Office auditor and continues this role as Principal Consultant with Plum Concepts & Solutions <http://www.plumcon.com.au/>.

His professional research skills and understanding of systems theory apply an uncomplicated approach to corporate governance and risk management. The evolution of this conceptual view can be seen in Ted's speeches, <http://www.plumcon.com.au/Publications/Publications.html> papers and two significant publications (QAO Audit Report N0.7 for 1998-99 and Standards Australia's HB 254-2005).

He can be contacted at [Ted.dahms@plumcon.com.au](mailto:Ted.dahms@plumcon.com.au)



### (Endnotes)

1. **Ted Dahms**, 2009. *The Road to Resilience is paved with sound risk management. New paradigms for risk professionals.* <http://www.plumcon.com.au/Publications/Publications.html>
2. **Enterprise Risk Management – Integrated Framework.** Committee of Sponsoring Organisations of the Treadway Commission, 2010. <http://www.coso.org/ERM-IntegratedFramework.htm>
3. **Michael Rasmussen**, Jan. 2007. *AS/NZS 4360 – A Practical Choice over COSO ERM. Best Practices* [www.forester.com](http://www.forester.com).
4. **Arjen Boin and Allan McConnell**, 2007. *Preparing for Critical Infrastructure Breakdowns: The Limits of Crisis Management and the Need for Resilience.* *Journal of Contingencies and Crisis Management*, 15(1) 51-58.
5. **ISO guide 73:2009.**
6. **Eric D Beinhocker**, 2006. *The Origin of Wealth. Evolution, Complexity, and the Radical Remaking of Economics.* Harvard Business School Press 2006.
7. **Peter Fryer**, 2009. *A brief Description of Complex Adaptive Systems and Adaptive Theory.* [www.trojanmice.com/articles/complexadaptivesystems.htm](http://www.trojanmice.com/articles/complexadaptivesystems.htm)
8. **Peter Fryer**, 2009 *Ibidem.*
9. **Eric D Beinhocker**, 2006. *The Origin of Wealth. Evolution, Complexity, and the Radical Remaking of Economics.* Harvard Business School Press 2006.
10. **Revised Guide to Principle 7, Recognise and Manage Risk.** ASX Corporate Governance Council 2008 [http://www.asx.com.au/supervision/pdf/asx\\_cgc\\_revised\\_supplementary\\_guidance\\_to\\_principle\\_7.pdf](http://www.asx.com.au/supervision/pdf/asx_cgc_revised_supplementary_guidance_to_principle_7.pdf)
11. **Control and Governance, - Number 1.** *Guidance on Control. The Canadian Institute of Chartered Accountants November 1995.*
12. **Ted Dahms**, 2008. *Risk Management and Corporate Governance are they the same?* [www.plumcon.com.au/Publications/Publications.html](http://www.plumcon.com.au/Publications/Publications.html)

# Measuring and comparing organisational resilience in Auckland

Stephenson, Vargo and Seville report on a web-based survey tool that allows organisations to measure and compare organisational resilience.

## ABSTRACT

Organisations often find it difficult to demonstrate the value added by emergency management and business continuity programs, and their progress towards becoming 'more resilient'. This is partly because these programs are compared to profit-driven activities for which there are metrics for evaluating whether or not they have produced financial growth. Resilience however, focuses on social and cultural factors within organisations which contribute to the organisations' ability to survive, and potentially even thrive, in times of crisis. The effectiveness and value of programs to build resilience are much more difficult to measure.

This paper presents the initial results of a web-based survey tool developed to address this gap and measure and compare organisational resilience. The tool enables organisations to identify resilience strengths and weaknesses and evaluate resilience management programs. In total 249 individuals representing 68 organisations in Auckland, New Zealand took part in the study. The results are discussed in terms of the resilience of the community of organisations in Auckland, the individual industry sectors that were represented, and the individual organisations that took part.

## Introduction

Within recent years organisations have increasingly focused on their ability to respond to crises; however they often struggle to prioritise and allocate resources to building resilience, given the difficulty of demonstrating progress or success. Dervitsiotis (2003) argues that conventional business excellence, such as that measured by the EFQM model or the Baldrige

Awards is not as effective in crisis situations. These traditional models, which are used to measure success during business as usual, do not provide a measure of resilience during and after crises.

The majority of research into organisational resilience has been qualitative and descriptive: attempts to quantitatively measure resilience have been limited (Somers, 2007) (Webb, et al., 1999). This research attempts to fill that gap by developing a web-based survey tool to quantitatively measure resilience. Measurements of resilience will enable organisations to answer key questions including: how resilient are we, how does this differ from our expectations and those of our stakeholders, and what can we do to improve? Given this information organisations will be able to better allocate resources to resilience and to demonstrate progress over time.

## Organisational resilience

Seville et al. (2008, p. 2) define organisational resilience as the ability of an organisation to "...survive, and potentially even thrive, in times of crisis". Organisations often refer to the resiliency as redundancy of their physical resources such as plant and machinery, locations or buildings, and the lifelines infrastructure on which they rely. The resilience of physical resources is important and is often most visible during and after a natural disaster such as an earthquake or flood which interrupts the flow of these resources. However organisations also have to manage crises such as financial downturns, pandemics, large scale product faults, supply chain failures, industrial accidents and staffing issues. Resilience to these types of crises is often, (although not exclusively) less visible and is manifested through an organisation's culture. Mitroff et al. (1989) argue that organisational culture is the most influential factor on crisis management and discuss whether or not some organisations exhibit characteristics that make them crisis-prone as opposed to crisis-prepared. Smith (1990) talks about how organisations often generate crises through three phases. One of the phases, the 'crisis of management' is characterised by a culture which lacks awareness and mindfulness (Weick & Sutcliffe, 2007) and so creates cascade failures and crises (Mitroff, et al., 1989). Hamel and Valikangas (2003, p. 2) discuss strategic resilience, arguing that it,

*"...is about continuously anticipating and adjusting to deep, secular trends that can permanently impair the earning power of a core business. It's about having the capacity to change before the case for change becomes desperately obvious".*

### Measuring organisational resilience

In order to measure resilience it is necessary to identify its constituent parts (Paton & Johnston, 2006). McManus et al. (2008) do this, providing a useful definition which is used as the basis for indicators adapted and developed through this research. They define organisational resilience as,

*"...a function of an organisation's overall situation awareness, keystone vulnerability and adaptive capacity in a complex, dynamic and interdependent system". (McManus, et al., 2008, p. 82)*

McManus et al. (2008) use this definition to identify three dimensions of organisational resilience; situation awareness, management of keystone vulnerabilities, and adaptive capacity. Situation awareness describes an organisation's understanding of its business landscape, its awareness of what is happening around it, and what that information means for the organisation now and in the future (Endsley, et al., 2003). Management of keystone vulnerabilities describes the identification, proactive management, and treatment of vulnerabilities that if realised, would threaten the organisation's ability to survive. This includes emergency and disaster management, and business continuity, and covers many of the traditional crisis planning activities. Adaptive capacity describes an organisation's ability to constantly and continuously evolve to match or exceed the needs of

its operating environment before those needs become critical (Hamel & Välikangas, 2003). In their discussion of the definition of organisational resilience, McManus et al. (2007) use the results of their qualitative study to identify fifteen indicators, five for each of the dimensions. These indicators and dimensions were reviewed as part of this research and one further dimension 'resilience ethos', as well as a further eight indicators, were added to the model for evaluation; these can be seen in Table 1. The shaded areas in Table 1 show the resilience ethos dimension and the eight indicators that were added to the original model to form the basis of the resilience measurement tool. Resilience ethos describes a culture where top management is committed to balancing profit-driven pressures such as efficiency with the need to be resilient (Wreathall, 2006). This culture represents "...a willingness to share and refresh knowledge and constant readiness to take community action" (Granatt & Paré-Chamontin, 2006, p. 53).

The resilience measurement tool was developed as a web-based survey which uses the perception of staff members to measure the resilience of organisations. A cross section of staff from throughout the organisation were asked to take part in the survey to maximise the representativeness of the evaluation. In addition, one senior manager from each organisation completed a version of the survey that included additional questions relating to business performance.

In total, the survey contains 92 questions and takes between 20-30 minutes to complete. Each indicator is assessed using 3 or more questions which are averaged to form the score for that indicator. The majority of

**Table 1:** Updated Dimensions and Indicators of Organisational Resilience (Adapted from McManus, et al., 2007, p. 20)

Resilience Ethos					
RE <sub>1</sub>	Commitment to Resilience				
RE <sub>2</sub>	Network Perspective				
Organisational Resilience Factors					
Situation Awareness		Management of Keystone Vulnerabilities		Adaptive Capacity	
SA <sub>1</sub>	Roles & Responsibilities	KV <sub>1</sub>	Planning Strategies	AC <sub>1</sub>	Silo Mentality
SA <sub>2</sub>	Understanding & Analysis of Hazards & Consequences	KV <sub>2</sub>	Participation in Exercises	AC <sub>2</sub>	Communications & Relationships
SA <sub>3</sub>	Connectivity Awareness	KV <sub>3</sub>	Capability & Capacity of Internal Resources	AC <sub>3</sub>	Strategic Vision & Outcome Expectancy
SA <sub>4</sub>	Insurance Awareness	KV <sub>4</sub>	Capability & Capacity of External Resources	AC <sub>4</sub>	Information & Knowledge
SA <sub>5</sub>	Recovery Priorities	KV <sub>5</sub>	Organisational Connectivity	AC <sub>5</sub>	Leadership, Management & Governance Structures
SA <sub>6</sub>	Internal & External Situation Monitoring & Reporting	KV <sub>6</sub>	Robust Processes for Identifying & Analysing Vulnerabilities	AC <sub>6</sub>	Innovation & Creativity
SA <sub>7</sub>	Informed Decision Making	KV <sub>7</sub>	Staff Engagement & Involvement	AC <sub>7</sub>	Devolved & Responsive Decision Making

questions asked participants to gauge their agreement with a statement e.g. 'Most people in our organisation have a clear picture of what their role would be in a crisis'. This was done on a four-point scale ranging from 'strongly agree' to 'strongly disagree': a 'don't know' option was also provided. The data provided by staff was then averaged to provide a submission on behalf of the organisation.

## Organisational resilience in Auckland

In total 249 individuals representing 68 organisations from a cross-section of industry sectors, took part in the study. Organisations varied in size from 1 to 210 staff members and participation within organisations ranged from 1-100%. Table 2 shows the range of scores achieved by organisations in Auckland, how many organisations scored within each score boundary for each of the dimensions of organisational resilience, and the range of scores that they achieved.

For each of the four dimensions and overall resilience, the majority of organisations scored between 60-78% achieving a good score. This means that organisations in Auckland generally demonstrated a culture that supports and prioritises resilience and enables an awareness of the organisations' internal and external environment. Organisations generally have a good ability to adapt to their environment and use their situation awareness to inform and manage their planning efforts.

The size of the range of the scores for each dimension provides evidence that organisations differ in their strengths and weaknesses even though they may achieve similar overall resilience scores. Of those 68

organisations that achieved a good score (60-78%) for their overall resilience, 49 scored poorly or very poorly (0-50%) for at least one indicator. This shows that even organisations who achieve a good overall score are still likely to be able to improve significantly.

## Organisational resilience by industry sector

Table 3 shows average scores for each of the four dimensions of organisational resilience by industry sector, as well as the average overall resilience. The highest average score achieved for any one industry was the Government, Defence and Administration sector which averaged 92% for its resilience ethos and also averaged the highest overall resilience score (78%). For this sector, a breakdown of their resilience strengths and weaknesses would enable them to see which indicators are driving their high scores. These strengths could then be monitored to ensure that their high scores are maintained over time. An example of this kind of analysis is included in the discussion of the individual organisation below.

The lowest average score achieved for any one industry was the Agriculture, Forestry and Fishing sector which averaged 49% for its management of keystone vulnerabilities. This stems from a particular weakness in its planning strategies, including a lack of formal planning and a poor awareness of planning arrangements among staff. Again this information comes from analysing sector scores for individual indicators and could provide industry groups, regulators and government groups with direction on the information or resources that might help an industry as a whole to improve its resilience.

**Table 2:** Number of Organisations Scoring Within Each Score Boundary for the Dimensions and Overall Organisational Resilience

Benchmark Resilience Score Boundary	Number of Organisations – Dimensions of Organisational Resilience				
	Resilience Ethos	Situation Awareness	Management of Keystone Vulnerabilities	Adaptive Capacity	Overall Resilience
88-100% Excellent	7	1	0	2	0
79-87% Good	21	10	0	11	6
60-78% Satisfactory	34	50	42	48	51
51-59% Unsatisfactory	4	6	17	6	5
42-50% Poor	1	1	8	0	2
0-41% Very Poor	1	0	1	1	0
<b>Low-High Scores (Range)</b>	33-92% (59%)	49-88% (39%)	33-77% (44%)	40-95% (55%)	44-83% (39%)

**Note:** The bottom row shows the lowest and highest scores for each dimension and the range is shown in brackets.

The Communications sector achieved the highest average for the adaptive capacity dimension. This stems from a score of 89% in the strategic vision and outcome expectancy indicator; they were one of only two sectors to score 'excellent' on any one indicator. The strategic vision and outcome expectancy indicator is designed to measure whether the organisation has a defined strategic vision and whether that vision is understood and shared across the organisation. Questions relating to this indicator focus on whether or not the organisation has a formalised strategic vision, whether or not staff recognise that vision as reflecting the values that they aspire to, and whether their vision is continuously re-evaluated as their organisation changes.

**Table 3:** Average Scores for Each of the Four Dimensions of Organisational Resilience by Industry Sector

Industry Sector	Resilience Ethos	Situation Awareness	Management of Keystone Vulnerabilities	Adaptive Capacity	Overall Resilience
Agriculture, Forestry and Fishing	75%	65%	49%	65%	64%
Communication	80%	76%	61%	78%	74%
Construction	58%	66%	58%	76%	65%
Cultural and Recreational Services	77%	63%	60%	77%	69%
Education	75%	64%	59%	70%	67%
Finance and Insurance	67%	69%	60%	62%	65%
Government Defence and Administration	92%	72%	74%	75%	78%
Health and Community	86%	75%	69%	77%	77%
Manufacturing	71%	69%	57%	68%	66%
Personal and Other Services	75%	70%	64%	70%	70%
Property and Business Services	75%	71%	61%	71%	70%
Retail Trade	85%	71%	58%	70%	71%
Wholesale Trade	71%	66%	57%	71%	66%
All Sectors	74%	68%	59%	71%	69%

**Note:** These figures relate to the model of organisational resilience proposed through this paper which may alter following subsequent analysis of the resilience indicators. Data shown represents averaged scores and so cannot be interpreted using the score boundaries shown in Table 2.

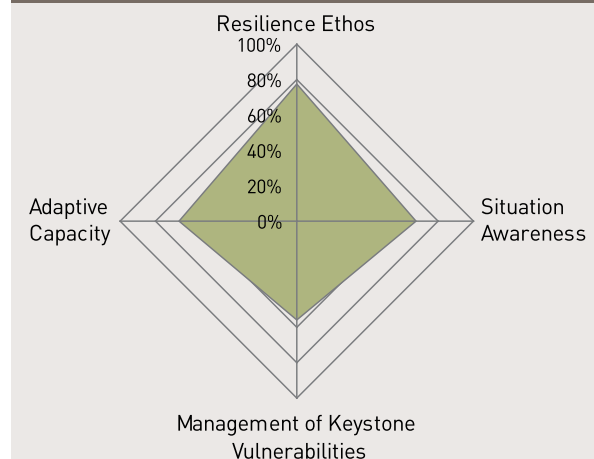
### Organisational resilience: Internal and external comparisons

Using the resilience measurement tool, individual organisations can see how their resilience compares to other organisations, and how their departments or business units, sites or locations, compare with each other. This then provides important information for resourcing, staff allocation, corporate processes, knowledge management and organisational culture. Each organisation received a results report detailing their resilience strengths and weaknesses. As an example, Graph 1 shows an organisation's scores (strengths and weaknesses) for each of the indicators of organisational resilience.

This organisation's resilience strengths include its commitment to resilience (77%) and network perspective (78%) as well as its internal and external situation monitoring and reporting (73%) (as shown in Graph 1). This means that the organisation has a culture that supports and prioritises resilience and that it has processes in place for monitoring changes and trends in its environment over time. These changes and trends could include regulatory changes, increasing or slowing demand for products or services, social changes, technological development etc. Knowledge of these conditions before they contribute to a crisis for the organisation could significantly increase the organisations' resilience. Alternatively this knowledge could also be translated into competitive advantage and opportunity.

Grouping the indicators, as shown in Table 3, this organisation's strongest dimension is its resilience ethos and its weakest is its management of keystone vulnerabilities: this is summarised in Figure 1. Based on the definitions of these dimensions discussed earlier, to improve this organisation should focus on formalising, sharing and exercising their plans and arrangements, as well as leveraging off of their current strengths in a crisis.

**FIGURE 1.** Example of an Organisation's Scores for each of the Indicators of Organisational Resilience



**Note:** Results represent the results of 31 members of staff (89% of the organisation).



Organisations can also use this level of analysis to examine how their resilience fluctuates across hierarchical levels in their organisation. An example of this is how many staff within participating organisations were not aware that their organisation had an emergency plan; interestingly some senior managers were not aware of existing plans either. This is evidence of silo mentality within organisations where emergency plans and arrangements are developed within a department or by a specific individual in isolation, within a silo, and plans are not widely shared or communicated. This silo mentality in particular, contributed to lower scores for the planning strategy indicator for most of the organisations that took part.

### Conclusion

For organisations to invest in resilience there must be an evidenced way of measuring it, and of demonstrating changes and trends in this measurement over time. This will then enable organisations to make a business case for resilience and to show the value added by resilience management programs.

Overall the Auckland organisations taking part in this study have a good level of resilience. Common strengths include a good resilience ethos and a high level of adaptive capacity; however the distribution of these strengths varies across industry sectors. Common weaknesses include organisations' ability to utilise resources from outside of their organisation during a crisis. The high level of interconnectivity and interdependency between organisations makes this a

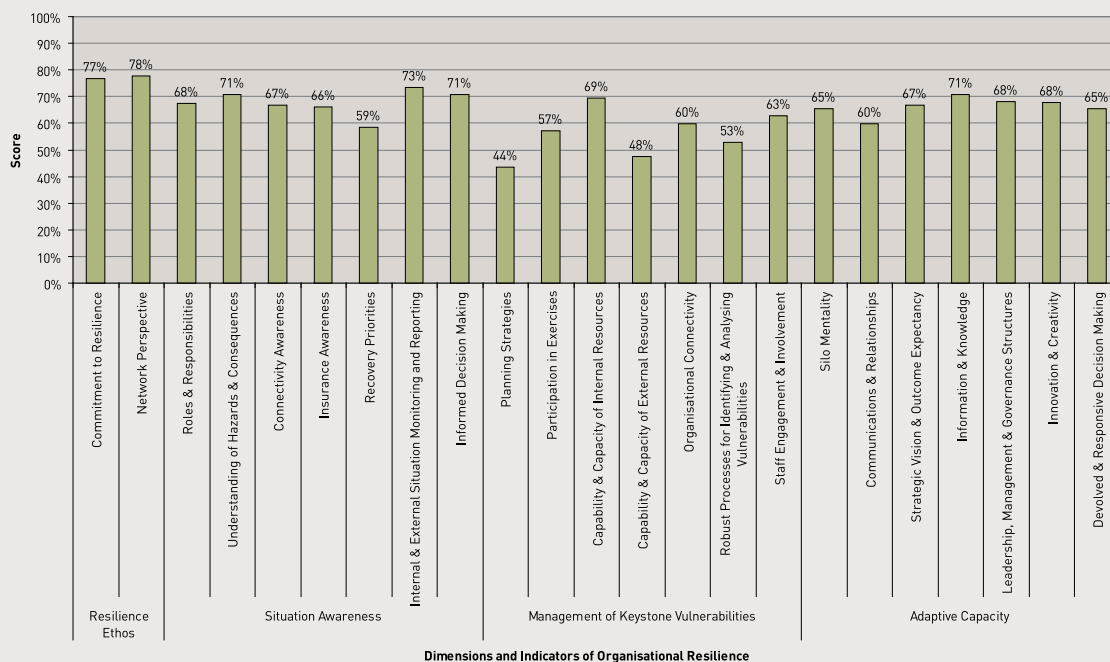
critical indicator that organisations and industry groups should continue to monitor.

The resilience measurement tool also enables analysis of organisational resilience by industry sector. Industry groups, regulators, and local and regional government groups may find this information useful in understanding training and education needs, the most common resilience challenges, and how they can help organisations to address these.

Analysis of organisational resilience by industry sector is also important for individual organisations. Organisations can identify whether they are more or less resilient than other similar organisations and can also identify the resilience strengths which stand them apart from others. These strengths can then be translated into competitive advantage during and after industry wide crises or negative trends such as rising costs of raw materials, agricultural disease outbreaks, or product recalls. Individual organisations can also use the tool to examine their resilience internally, allowing them to address gaps in awareness and silos between offices, departments and business units, or organisational functions.

The limitations of the tool at this time are that it is still in its early stages of development and that it requires a high level of staff participation to create accurate results for individual organisations. This in itself though is not a bad thing as staff participation will increase awareness and generate discussions around resilience. The next steps in developing this tool are to complete further tests including organisations in other areas of New Zealand and in other countries.

**GRAPH 1.** An example of organisations scores for the indicators of organisational resilience



Note: Results represent the results of 31 members of staff (89% of the organisation).

## References

- Dervitsiotis, K. N.** (2003). *The Pursuit of Sustainable Business Excellence: Guiding transformation for effective organisational change*. *Total Quality Management*, 14(3), 251-267.
- Endsley, M. R., Bolte, B., & Jones, D. G.** (2003). *Designing for Situation Awareness An Approach to User-Centred Design*. London: Taylor & Francis.
- Granatt, M., & Paré-Chamontin, A.** (2006). *Cooperative Structures and Critical Functions to Deliver Resilience Within Network Society*. *International Journal of Emergency Management*, 3(1), 52-57.
- Hamel, G., & Välikangas, L.** (2003). *The Quest for Resilience*. *Harvard Business Review*, 81(9), 52-63.
- McManus, S., Seville, E., Brunson, D., & Vargo, J.** (2007). *Resilience Management: A Framework for Assessing and Improving the Resilience of Organisations (No. 2007/01): Resilient Organisations*.
- McManus, S., Seville, E., Vargo, J., & Brunson, D.** (2008). *A Facilitated Process for Improving Organizational Resilience*. *Natural Hazards Review*, 9(2), 81-90.
- Mitroff, I. I., Pauchant, T. C., Finney, M., & Pearson, C.** (1989). *Do (Some) Organisations Cause their Own Crises? The Cultural Profiles of Crisis-prone vs. Crisis-prepared Organisations*. *Industrial Crisis Quarterly*, 3(4), 269-283.
- Paton, D., & Johnston, D.** (2006). *Identifying the Characteristics of a Resilient Society*. In D. Paton & D. Johnston (Eds.), *Disaster Resilience: An integrated approach*: Charles C Thomas Publisher Ltd.
- Seville, E., Brunson, D., Dantas, A., Le Masurier, J., Wilkinson, S., & Vargo, J.** (2008). *Organisational Resilience: Researching the Reality of New Zealand Organisations*. *Journal of Business Continuity and Emergency Management*, 2(2), 258-266.
- Smith, D.** (1990). *Beyond Contingency Planning: Towards a model of crisis management*. *Industrial Crisis Quarterly*, 4(4), 263-275.
- Somers, S.** (2007). *Building Organisational Resilience Potential: An Adaptive Strategy for Operational Continuity in Crisis*. Unpublished Doctoral, Arizona State University, Arizona.
- Webb, G. R., Tierney, K., & Dahlhamer, J. M.** (1999). *Businesses and Disasters: Empirical Patterns and Unanswered Questions (No. Preliminary Papers;281)*. Delaware: Disaster Research Center.
- Weick, K. E., & Sutcliffe, K. M.** (2007). *Managing the Unexpected Resilient Performance in an Age of Uncertainty (2nd ed.)*. San Francisco, CA: Jossey-Bass.
- Wreathall, J.** (2006). *Properties of Resilience Organizations: An Initial View*. In E. Hollnagel, D. D. Woods & N. Leveson (Eds.), *Resilience Engineering: Concepts and Precepts (pp. 275-286)*. Aldershot: Ashgate.

## About the authors

**Amy Stephenson** is a Ph.D. candidate at the University of Canterbury, New Zealand. Her research focuses on measuring, comparing and benchmarking the resilience of organisations.

**John Vargo** is a Senior Lecturer in Information Systems, Founder of the e-Commerce programme and Co-Founder of the eSecurity Lab at the University of Canterbury, New Zealand. His interests focus on the conjunction of business practice and technology application with an emphasis on building resilience in the face of systemic insecurity.

**Erica Seville** is a Research Fellow in the Civil and Natural Resources Engineering Department at the University of Canterbury, New Zealand, and leads the Resilient Organisations Research Programme. Her research interests focus on building effective capability in risk management and resilience.

R

# Bushfire communities and resilience: What can they tell us?

Pooley, Cohen and O'Connor identify five factors that are important to communities experiences in mediating bushfire disasters.

## ABSTRACT

By using the experience of the community members to understand the experience of living in a bushfire affected community we can extract what factors that are important to a competent, resilient community. This current study used qualitative methods to determine that five factors (sense of community, social support and social networks, self efficacy, coping and community competence) are important aspects of the communities experience in mediating bushfire disasters.

## Introduction

Bushfires are a significant threat to many of our Australian communities. We have seen the devastation that can occur given the recent events like Black Saturday (February 7th, 2009). For these communities and for Australia the cost of this kind of disaster is unmeasurable. However in time to come we will quantify the cost in the given measures we have come to recognise and still it will possibly be known as the worst natural disaster in Australian history.

It is obviously difficult to understand where one begins to learn from the levels of devastation we see in large disasters like Black Saturday. Royal commissions, internal reviews, lessons learnt forums will all take place and there is no doubt that these are extremely important to understand what happened and to mitigate future events. However as researchers one of the most important things we can offer to the table is our research. It is an important opportunity to provide information, aid in understanding and offer experience with which our process of healing and recovery may continue and the cycle of prevention and preparedness begin.

This case study of a semi rural outer metropolitan community was undertaken to determine which factors are important in understanding the experience of community members living with the threat of natural seasonal bushfires. In order to address this aim an in-depth qualitative approach was used to obtain an understanding of the experience of living with this threat in a contextual, holistic way.

The use of qualitative methodologies allows researchers to examine the experiences, thoughts, feelings and ideas of community members. Qualitative data contributes a quality of 'undeniability' through a source of well-grounded, rich descriptions and explanations of processes occurring in communities (Miles & Huberman, 2002; Smith, 1978). Techniques, such as interviews and focus groups allow researchers to obtain knowledge and an understanding of issues for a smaller sample of participants in far more depth (Patton, 1990). These methods are also most appropriate when the researcher is attempting to understand complex systems, values or emotions.

For the purpose of this research a narrative approach was considered most appropriate, as this would provide access to the salient views, values and reality of living in seasonally threatened bushfire community. Further to this, the study used two different techniques in order to obtain a rich and full understanding of the experience of living in a bushfire community. Narrative interviews were used in order to understand the complexities and processes that emphasised the community members' experience (Mishler, 1991), and a focus group was used to validate the findings that emerged from the interviews with regard to what factors are important in living in a seasonally threatened community.



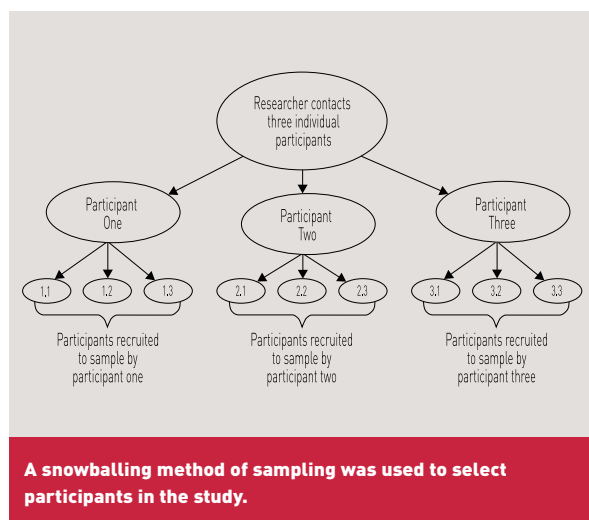
Narrative interviews were used to explore complexities and processes and focus groups were used to validate findings.

## Research context

The setting for this study is the community of Darlington is a semi – rural eastern suburb of Perth, Western Australia. Located in the heavily timbered hills that lie to the east of Perth (40 kms from the city centre), Darlington forms a backdrop for the city of Perth and the Swan River. Established in 1886 Darlington has a population of 3 449 (1705 males and 1744 females) residents with 1 244 dwellings located in the area (Statistics, 2006). Whilst its location in the hills provides a main attraction for many residents, the natural environment contributes to the seasonal threat of bushfires. The shire area, of which Darlington is a part of, has historically been one of the most threatened, in the metropolitan region of Perth. It is estimated that there were approximately six large fires per year (and a lot of small ones) about twenty years ago.

## Stage one - Participants

In order to build a sample of community members, a snowballing method of sampling was used (Patton, 1990). The sample comprised 15 participants, 10 females and 5 males, whose ages ranged from 18 to 68 years (M = 38.31; SD = 15.59). The participants came from various parts of the community, for example, some lived and worked in the local community while others lived in the local community but worked outside it.



## Materials and procedure

A narrative interview schedule (Reissman, 1993) was utilized for all of the interviews. The researcher referred to the narrative storyline and read the following instructions to the participants.

*“Tell me in your own words the story of the bushfire you were in. I have no set questions to ask you. I just want you to tell me about what happened to you, your family and your friends. Just tell it to me as if it were a story with a beginning, middle and an end. There is no right or wrong way to tell your story. Just tell me in a way that is the most comfortable for you”*

Community members became involved by responding to a notice placed at the Darlington library. A total of 15 interviews were conducted as saturation point was reached. Saturation point occurs when no new information elicited from subsequent interviews (Miles & Huberman, 2002).

## Data collection and analysis

For each interview, data collection and analysis occurred simultaneously, and throughout the data analysis process the data was organised categorically, and was repeatedly reorganised and recoded according to themes recognised by the researcher. A list of the major ideas and themes generated were chronicled for each narrative interview and then compared with the ideas and themes resulting from previous narratives. Utilising thematic analysis allows the researcher to organise qualitative data coherently (Miles & Huberman, 2002). The result was a set of themes that were derived from the community members’ narratives.

## Stage two

In order to validate the information obtained in stage one this second stage utilized a focus group to triangulate the data (Searle, 1999). Triangulation relates to the utilization of different methods of data collection within a single study to confirm or validate the focus of the investigation (Lincoln & Guba, 1985). Therefore a focus group was held to explore the perspectives of a range of members in relation to living in a bushfire threatened community.

## Participants

Community members involved in the focus were 6 female Darlington residents whose ages ranged from 24 to 72 (M = 35.28, SD = 17.59).

## Materials and procedure

The same narrative format was used as with the interview with the focus group participants weaving their stories around one another. Some community members who responded to the noticeboard advertisement expressed the desire to meet together to discuss their experiences of living in a bushfire community. These particular participants formed the focus group.

## Data collection and analysis

The focus group data was content analysed through the identification of themes elicited from the data. It was not important to glean quantitative information from the sorted data but to obtain themes that related to the experience of living in a bushfire threatened community. This process was checked and re-checked with a peer to ensure dependability and credibility of the identified themes.

## Findings and interpretations

Five main themes were identified in the responses from the community members. The following themes represent those that emerged from the interview analyses. All of these themes were confirmed through analysis of the focus group data.

### Sense of Community (SoC)

The first theme, which emerged consistently, was that of sense of community, or as referred to by many residents, 'community spirit'.

*There is a very big community spirit up here, huge actually and we live here because of that.*

The components of sense of community, as presented by McMillan and Chavis (1986), appear in the participant responses. First, Membership, where people feel they belong or relate to others. Residents indicated that they feel closer to people in the community, as they had similar experience of fires.

*I think the fires unite you in a sense, there is that sharing type feeling that you get because you've all gone through it. I personally feel closer to the people who've been through a fire rather than those who haven't.*

Or

*I would describe the community of Darlington as unique and insular, a community that is factionalised into smaller sub-groups which could be described as very "cliquey". The individual groups are very diverse and have very well defined boundaries overlaid with a large amount of elitism.*

There is a sense that people share events, like parties, picnics and fires (*shared emotional connection*). Needs of the individuals are met by living in Darlington (*fulfillment of needs*) and that this in turn produces influence. Sense of community is important to community members in relation to involvement in community activities and safety.

*The community spirit is fantastic up here and you can really see that when something really bad happens.*

Their sense of community is important to people remaining in the community after a disaster. The strong sense of neighboring may possibly be a factor that helped people survive economically, emotionally and spiritually.

*There is a lot of community spirit here and neighbours work to help one another with clearing and cleaning of their land.*

People who actively participate when there is a disaster have positive attitudes toward their community and remain in the community after the crisis has passed, finding a strengthened sense of belonging. The appearance of this theme (SoC) supports earlier research by Bachrach and Zautra (1985), Bishop, Paton, Syme & Nancarrow, (2000), and Paton (1994) indicating that sense of community is an important resource for people in times of stress. Additionally, the present study is qualitative, which adds support to other authors that have addressed the relevance of SoC quantitatively. This also indicates that SoC is relevant across a number of hazard contexts i.e., hazardous waste, salinity and bushfire. The connection point for sense of community may be the importance of social support networks.

### Social networks and social support

Residents identified different social networks operating in the community. Social networks include formal and informal structures/groups in the community.

*We have groups that have all manners of function (ratepayers, artists groups, the council....they all rally around the fires event to get things done.*

Residents were able to describe a wide variety of support ranging from, friends, family, neighbours, to community groups like the State Emergency Service, ratepayers association, the local council and the local volunteer fire brigade. This indicates that the residents of Darlington are aware of the different people within the community that they can call on for help or in times of need.

*We began to receive lots and lots of phone calls from people trying to find out what was happening.*

It also indicates that the community is fairly well connected and therefore has the structures available to allow members to communicate with each other.

*People are made aware where their neighbour's taps and hoses are in their yards, and they make plans with each about what they will do in the event of a fire. They also swap work and home phone numbers so that they can contact each other. They tell each other about the whereabouts of their kids and their pets.*

In concert with the social network literature this theme suggests that residents are accessing a number of other people, which relates to the size of the network people have and reporting access to different types of people, which refers to the structure of their network. This network is providing the bridge between the individuals and the community of Darlington.

*As I reached the main road, the volunteer fire brigade arrived, along with a friend who took the boys and my husband who had been alerted at work and had come immediately home.*

In terms of stress buffering, the Darlington residents are utilizing their support networks and then forming others when needed (Fleming, Baum, Gisriel & Gatchel, 1982; Kaniasty & Norris, 1993; Padgett, 2002). The existence and recognition of the importance of community groups in Darlington may indicate that these social support networks were not necessarily disrupted in the aftermath of a bushfire, as they continue to be salient (Milne, 1977). The importance of the community-based groups/networks also related to coping in Darlington.

### Coping

Coping was an important aspect of living in the Darlington community.

*We now have a rule also that someone must always be on the property in case of fire.*

Coping included a number of coping strategies such as, emotional, problem-focused and avoidant. Many plans for managing bushfire threats have developed from problem-focused coping mechanisms.

*I was dreadfully concerned about how they would cope once the smoke started to effect them. As well as feeling concerned for my class, I was also trying to contact Dick and Dora, and finally located them.*

Coping strategies are evident at the individual and community level. For example, the Darlington community has put in place a fine system to deal with those residents that do not clear fire breaks etc, ready for the next summer season.

*As a direct consequence of this fire, we have fenced an area around our house and we now only garden in that area.*

The coping strategies identified are indicative of the types of coping behavior presented in the literature in relation to disaster events (Folkman & Lazarus, 1990).

### Self efficacy

Related to coping is the way in which residents responded to situations, by doing things that they had planned to do, or made decisions about what to do in the face of little or no information emerged from the interviews and focus group. This is identified as self-efficacious behavior.

*I decided to do a reconnoitre and see what was happening, so I jumped into the van and drove part way down my property. From where I could see the smoke I thought that we didn't look too badly off but I decided to keep an eye on things in any case.*

The self perceived capability of residents to respond in situations is important in terms of their actual performance and response. Residents indicated that they felt helpless when they did not know what to do, but when they become aware of the things they need to do they start to engage in preventative behaviours, such as gutter cleaning etc.

*I felt particularly helpless because I didn't really know what I was supposed to be doing. Families that live here need to have that sort of knowledge and at least some sort of plan about what they will take from the house in the time of fire.*

These responses indicate that people will make judgments about their ability to carry out actions (Bandura, 1977;1986). In some cases they will act and in others they will not. The sense of control needed, in an event where there is no control, is regained when the Darlington residents behaved self-efficaciously. This inevitably enables them to cope (Bandura, 2002).

*Now that I know the correct things to do in the event of a fire, I feel that I would always stay at the house rather than leave. I know for example to shut the doors and windows and to watch for the outbreak of spot fires. We have also planted fire retardant trees on our land. We are also very conscious of fire prevention at the beginning of each summer season and do all the required clearing and cleaning of our land and around the house. For example, we move any chopped wood away from the house.*

For residents that felt helpless the recognition of a need for a plan of action indicated that with self-efficacy,

stress reduction may follow (Millar, Paton & Johnston, 1999).

### Community competence

The final theme identified referred to the competence of the community. Community competence describes the processes and mechanisms in the community that take place in order to carry out living in a bushfire threatened community.

*I feel that a direct result of the fire is that people are far more aware now of the fire risk, that they are far more cautious, and that they are far more pro-active about keeping their gardens clean of rubbish etc.*

In support of Sonn and Fisher's (1998) argument, the Darlington community indicates competence, as it negotiates what needs to occur to manage and resolve the effects of bushfires, in other words it copes with adversity.

*As well as the strategies used by the school, the local volunteer fire brigade plays a huge part in the community with the work they do all year round.*

*I was very involved in that one, liaising between schools, ensuring the safety of the children, contacting the police and the fire brigade and making sure that the phones continued to be manned in order for parents to reach us to find out about the safety of their children.*

Residents referred to the methods used by the community to plan for the future, and the processes that are employed in times of stress.

*Several public meetings were held to plan strategies and organize people for any future dramas of this kind. This was planned right down to little things like neighbours ringing one another to discover if they are at home. The volunteer bush fire brigade does a tremendous job with its cleaning and clearing operations and the local residents who are unable to do this sort of work for themselves really rely on those volunteers to get the job done.*

*Since that fire, at considerable expense and using money that could have been spent elsewhere, the junior school has taken practical steps to create a safe haven for the children and members of the community in the event of future fires.*

These plans are in line with some of Cottrell's (1976) components of community competence, in particular the identification and collaboration aspects. Therefore, although the Darlington community does recognize the repertoire of skills it has, other areas (needs identification, working consensus) were not identified, which may be relevant to enhance the community's ability to cope with future disasters (Cottrell, 1976).

### Discussion

The findings suggest a number of important issues. First, the themes that emerged from the present study support the themes that have been documented by other studies in the literature. For example Bachrach and Zautra (1985) and Bishop et al (2000) identified sense of community, self-efficacy and coping as important factors for community involvement in dealing

with hazardous waste and salinity, respectively. Whereas Kulig (2000) concluded that the concepts of community competence and sense of community are important in understanding how landslide communities cope. The findings of the current study would therefore support the notion that these concepts are as salient to this semi rural bushfire threatened community as they are to a small United States hazardous waste threatened community, an Australian farming community (salinity) and a Canadian rural community (landslides).

Second, although previous studies have suggested that all of these factors may be important to disaster communities few studies have utilized the experience of the community members to determine the salient themes within a disaster community. For example, the studies carried out by Bachrach and Zautra (1985) and Bishop et al (2000) utilized quantitative scales to measure these concepts within a given community. The data collection methods used within the present study is arguably more contextually based as they were conducted with people living in the bushfire threatened community. The approaches used are therefore direct and inclusive. In addition the use of the qualitative methodologies has provided a starting point to investigate factors that are directly relevant to individuals and to communities. The qualitative exploration of some of these factors in this disaster context adds to the empirical literature. The use of different data collection techniques (interviews and a focus group) strengthens the reliability of the findings through data triangulation (Searle, 1999). Further to this it must be noted that a majority of the participants involved in this study were women (16 female and 5 male) and therefore the issues raised may be more indicative of female views of a disaster community. However, Enarson (1998) argues that women have very important roles in our community; they transmit knowledge about family, community and

the environment and are key players in community mobilization in pre disaster and in post disaster activities. Traditionally disaster research methods utilized have not been inclusive of women.

Finally, the results of the present study suggest that there is no single factor that represents the experience of living in a disaster community. These variables are however central to the way in which the Darlington residents deal with living in a community that is seasonally threatened by bushfires. At the community level, two distinct factors emerged as being important to the Darlington community. For Darlington residents it was the attachment (sense of community) that residents reported which determined their desire to remain in their community, and the way that Darlington, as a whole community, is able to facilitate and manage its processes (community competence) of being a community and coming together when and where necessary that was seen as important to the experience of the individual members.

The themes that emerged suggest that it is a combination of factors that are relevant to a disaster experience at the individual level and the community level. The factors identified (self-efficacy, coping style, social networks, sense of community and community competence) presented a more comprehensive picture of the possible variables that may mediate the disaster experience. It is therefore the interplay of these factors that are important to the experience of a community facing a natural seasonal disaster. Further to this is the relationship between, and the combination of, community competence and sense of community. Kulig (2000) refers to the combination of these variables as community resilience (see Pooley, Cohen & O'Connor, 2006). Therefore one of the conclusions from this study results is that by increasing the competence of the community and the attachment residents have for the community you may be targeting and effecting community resilience.



**Women have very important roles in our community and are key players in community mobilization in pre and post-disaster activities.**

## References

- Bachrach, K. M., & Zautra, A. L.** 1985. *Coping with a community stressor: the threat of a hazardous waste facility.* *Journal of Health and Social Behavior*, Vol. 26, No. 2, pp. 127-141
- Bandura, A.** 1977. *Self-efficacy: Toward a unifying theory of behavioral change.* *Psychological Review*, pp.191-215.
- Bandura, A.** 1986. *Self-efficacy.* In A. Bandura (Ed.), *Social Foundations of Thought and Action: A Social Cognitive Theory* (pp. 390-453). Englewood Cliffs, N.J.: Prentice Hall.
- Bandura, A.** 2002. *Growing primacy of human agency in adaptation and change in the electronic era.* *European Psychologist*, Vol. 7, No 1, pp. 2-16.
- Bishop, B., Paton, D., Syme, G., & Nancarrow, B.** 2000. *Coping with environment degradation : salination as a community stressor.* *Network*, Vol. 12, No. 1, pp. 1-15.
- Blong, R.** 2003. *Development of a National Risk Framework.* Paper presented at the Australian Disaster Conference, Canberra.
- Cottrell, LS, Jr.** (1976). *The competent community.* In BH Kaplan, RN Wilson, & AH, Leighton (Eds.), *Further explorations in social psychiatry* (pp. 195-209).
- Enarson, E.** 1998. *Through women's eyes: A gendered research agenda for disaster social science.* *Disasters*, Vol. 22, No. 2, pp.157-173.
- Eng, E., & Parker, E.** 1994. *Measuring community competence in the Mississippi Delta: the interface between program evaluation and empowerment.* *Health Education Quarterly*, Vol. 21, pp. 199-220.
- Fleming, R., Baum, A., Gisriel, M., & Gatchel, R.** 1982. *Mediating influences of social support on stress at Three Mile Island.* *Journal of Human Stress*, Vol. 8, pp. 14-22.
- Folkman, S., & Lazarus, R. S.** 1980. *An analysis of coping in a middle-aged community sample.* *Journal of Health and Social Behavior*, Vol. 21, pp.219-239.
- Kaniasty, K., & Norris, F. H.** 1993. *A test of the social support deterioration model in the context of natural disaster.* *Journal of Personality and Social Psychology*, Vol. 64, No 3, pp. 395-408.
- Kulig, J. C.** 2000. *Community resiliency: The health potential for community health nursing theory development.* *Public Health Nursing*, Vol. 17, No. 5, pp. 374-385.
- Lincoln, Y. S., & Guba, E. G.** 1985. *Naturalistic Inquiry.* London: Sage Publications.
- McMillan, D. W., & Chavis, D. M.** (1986). *Sense of community: A definition and theory.* *Journal of Community Psychology*, Vol. 14, pp. 6-19.
- Miles, M. B., & Huberman, A. M.** 2002. *The Qualitative Researcher's Companion.* London: Sage.
- Millar, M., Paton, D., & Johnston, D.** 1999. *Community vulnerability to volcanic hazard consequences.* *Disaster Prevention and Management*, Vol. 8, No. 4, pp. 255-260.
- Mishler, E. G.** 1991. *Language, meaning and narrative analysis.* In E. G. Mishler (Ed.), *Research Interviewing: Connect and Narrative* (pp. 66-143). Cambridge: Harvard University Press.
- Paton, D.** 1994. *Disasters, communities and mental health: Psychological influences on long-term impact.* *Community Mental Health in New Zealand*, Vol. 9 No.2, pp. 3-14.
- Patton, M. Q.** 1990. *Qualitative Evaluation and Research methods.* London: Sage.
- Pooley, J.A., Cohen, L., & O'Connor, M.** 2006. *Community resilience and its link to individual resilience in the disaster experience of cyclone communities in Northwest Australia.* In D. Paton & D. Johnston (Eds) *Disaster Resilience: An Integrated Approach.* Springfield, Illinois: Charles C Thomas
- Riessman, C. K.** 1993. *Narrative Analysis.* London: Sage.
- Searle, A.** 1999. *Introducing Research and Data in Psychology: A guide to methods and analysis.* London: Routledge.
- Smith, J. A.** 1978. *Semi-structured interviewing and qualitative analysis.* *Rethinking Methods in Psychology*, pp.9-26.
- Sonn, C. C., & Fisher, A. T.** 1998. *Sense of community: community resilient responses to oppression and change.* *Journal of Community Psychology*, Vol. 26, pp.457-472.
- Statistics, A. B. S.** 2006. *Census, 2006, from* [www.abs.gov.au/ausstats](http://www.abs.gov.au/ausstats)

## About the authors

**Julie Ann Pooley**, PhD is a Researcher and Senior Lecturer at Edith Cowan University.

**Lynne Cohen** PhD is Associate Dean in Teaching and Learning at Edith Cowan University.

**Maira O'Connor** PhD is a Senior Research Fellow at Curtin University's Centre for Cancer and Palliative Care.





# Towards resilience against flood risks

Gissing, Keys and Opper discuss potential advances in flood emergency management through an analysis of the key relationships, trends and challenges facing flood emergency management agencies seeking to increase resilience against flood threat in Australia.

## ABSTRACT

Increasing the resilience of communities and individuals against natural and other hazards is the primary goal of emergency management. In Australia flooding constitutes a major environmental threat, and the start of the 21st century has seen emergency services developing their flood emergency management capabilities in increasingly challenging and uncertain circumstances. This paper discusses key trends and challenges facing flood emergency management agencies in seeking to increase resilience against the flood threat and proposes some potential advances in flood emergency management. In addition, the paper explores the importance of relationships between emergency management, flood warning and floodplain management agencies in managing future trends and challenges.

## Introduction

Flooding remains the most costly natural hazard faced by Australia. Many individuals and communities are vulnerable to floods of various kinds and origins, and the challenge to increase personal and community resilience to the flood hazard is on-going. At present flood emergency management is evolving in an environment consisting of many challenges, some of which are new and are uncertain. They include climate change, inadequate community preparedness for flooding, lack of flood experience at the level of agencies and in the community generally, demographic change and the growing realisation of the importance of the provision of community information and warnings.

Flood emergency, flood warning and floodplain management agencies need to consider these trends and challenges and consider opportunities to advance key management objectives. The goal should be the better management of floods in terms of reducing their undesirable impacts on communities: this is how community resilience is built. This paper outlines the

key trends and challenges facing flood emergency management agencies and identifies areas where future advances can be made to enhance flood emergency management.

## The issues over coming years

### Climate change

Changes in our climate have been observed. The 2007 Intergovernmental Panel on Climate Change (IPCC) report states:

*“Warming of our climate system is unequivocal, as is now evident from observations of increases in global average air temperatures, widespread melting of snow and ice, and rising global average sea level” (IPCC, 2007, p 2).*

Sea level rise is of particular concern in the context of flooding: the past century has seen sea levels rise at an increasing rate in most parts of the world. Global sea level has risen since 1961 at an average rate of 1.8 mm/yr and since 1993 at 2.1 mm/yr (IPCC, 2007). Over the period 1920 to 2000 the estimated average relative sea level rise around Australia was 1.2mm per year (CSIRO & Australian Government Bureau of Meteorology, 2007).

The Australian Government Department of Climate Change (2009, p1) in a recent update on climate change science stated *“The climate system appears to be changing faster than earlier thought likely”*.

The Victorian Government (2009) in a recent Green Paper on Climate Change concluded that climate change will result in more frequent, more intense weather events (such as storms, strong winds, floods and heatwaves) and a higher risk of fire. This conclusion is supported by recent scientific studies on the affects of climate change in Australia, which have indicated that impacts will likely include increased storm surge heights, more frequent extreme rainfalls and a greater frequency of hailstorm events (Victoria Government, 2008; Australian Government Department of Climate Change, 2009).

Recent research has concluded that with 1 to 2 degrees of warming there would be a doubling in the number of people exposed to the risk of flooding in Australia (CSIRO, 2006).

An assessment of climate change risks to the Australian coast found that up to \$63 billion of existing residential buildings are potentially at risk of inundation from a 1.1 metre sea-level rise, with the number of buildings ranging from a lower estimate of 157,000 to an upper estimate of 247,600 (Australian Government Department of Climate Change, 2009).

Climate change will likely have significant effects on human health as outlined by the CSIRO:

*"Climate change could cause large increases in flooding deaths and injuries depending upon future changes in precipitation extremes". (CSIRO, 2006, p27)*

Almost certainly, climate change impacts will, if not managed appropriately, have an adverse impact on community resilience to the flood hazard. It will also progressively increase the demand on the services of the State and Territory Emergency Services (S/TESS) not only in their roles in responding to flooding, but across other control and support agency functions; and across the full spectrum of prevention, preparedness, response and recovery functions. This increased demand will occur at a time when the S/TESS are already experiencing increased demand for their services. For example, the Victorian State Emergency Service over the last ten years has seen a 199% increase in the number of tasks requiring response. Such increases have been noted in other emergency service agencies.

### **Enhancing community preparedness for flooding**

Holistic community engagement within an emergency management framework is about fostering a partnership with the community in which the community takes responsibility for emergency preparedness under the leadership of emergency and hazard management agencies (including local government). Post-flood research has demonstrated the success of well-prepared communities for flooding, in that they can save up to 80% of potential flood damages (Gissing, 2003; Bureau of Transport Economics, 2002; Wright and Smith, 1999).

Community preparedness for flooding in the main can be considered low in Australia. In a survey of flood preparedness in the Maribyrnong (Victoria) area, 50% of respondents rated their level of preparedness as either nil or poor (VICSES, 2008). Similar results were found in a 2005 survey of flood prone properties in Maitland, NSW, with only 14% of residents having undertaken any measures that might help in the event of a flood emergency (Hunter-Central River Catchment Management Authority, 2005). Recent community surveys in Victoria and NSW (ABS, 2007; VICSES, 2009; GNS, 2007) have found that only 8-20 percent of households have a written and rehearsed emergency plan. A NSW SES survey across four flood prone communities found only 7.9% of households had emergency kits prepared and that only 60% of property owners thought it necessary to be prepared for floods (GNS, 2007).

There is some evidence that the SES FloodSafe program, that attempts to provide locally tailored community education programs about flood risk and preparedness, is proving successful in improving community flood preparedness. An evaluation of a VICSES facilitated program in Benalla (Victoria) showed the following results after the application of the program (Molino Stewart, 2008):

- Residents reporting that they were unprepared for floods decreased from 31% to 2%.
- Residents reporting that they were very well or extremely well prepared for floods increased from 1% to 34%.
- The proportion of residents reporting that they had a home emergency plan increased from 8% to 24%.

A key challenge to enhancing community preparedness for flooding is not only the development of community awareness resources, but ensuring on-going effective community engagement to deliver and reinforce key messages and address community concerns. Effective engagement is labour-intensive and can be seriously challenged by a lack of community interest in flooding issues, especially during times of drought as has been experienced over much of Australia during the last decade. However, we cannot possibly aim to improve flood community preparedness without engaging with our communities. To be successful there is a need to understand community needs and for engagement to be based upon a two-way flow of communication.

### **Dealing with a lack of flood expertise**

Many underlying difficulties in flood emergency management originate from the fact that though floods do occur frequently across Australia, they do not usually occur frequently at the local level. The result is a lack of flood experience both at the community level and in emergency management agencies. In many of Australia's most populated floodplains, drought conditions have resulted in no significant flooding for many years. The result is complacent and unprepared communities and a significant challenge to emergency management agencies in ensuring that flood expertise is maintained at the local level without first-hand experience. Agency members come to suffer from a lack of flood management experience and can come to believe that flood management, if it does not need to be



Aerial shot of flood plains in the Lake Eyre Basin.

implemented for long periods, has become unimportant and unworthy of continuing effort and commitment. This leads to a need for increased education, engagement, guidance, training and exercising of agency members as well as in the wider community.

The occurrence of other significant emergencies (eg. the September 11 terrorist attacks in 2001, the Asian Tsunami in 2004, the Black Saturday Bushfires and H1N1 pandemic threat in 2009 and the long lasting current Australian drought) has seen prominence given to hazards such as bushfires, terrorism, tsunami and pandemics by governments, the media and the community. This has created a number of challenges for flood emergency management agencies in attracting resources for specific flood related projects, but also in developing strategies to benefit from investment in other hazards, by drawing synergies with the management of them in an all hazards framework. It has also seen some resources used to complete flood-related projects being shifted to contribute to projects relating to other hazards.

### **Understanding the impacts of demographic change on resilience**

Demographic change is occurring in Australia, requiring emergency management agencies to adapt their service delivery strategies and methods to ensure community needs are met. The following key trends related to community vulnerability are being experienced:

- The sea change shift, with more people moving to live in coastal communities, creating an increase in vulnerability to coastal and estuarine flooding. When combined with the potential impacts of coastal flooding under conditions of sea level rise this trend is likely to impose substantial challenges on emergency management agencies placing further emphasis on the need to ensure appropriate floodplain and emergency management principles are applied to land use planning.
- Increasingly culturally diverse communities, creating challenges in engaging and communicating with different culturally and linguistically diverse communities, before, during and after floods.
- The aging of the population, resulting in increased community vulnerability and likely increases in the numbers of people needing help in times of floods and storms especially when evacuation is required. An aging workforce also results in specialist flood management skills shortages and a loss of critical knowledge.

### **Improving community flood information and warnings**

The purpose of community-based flood information and warnings is to provide advice to community members about impending flooding and the necessary response actions, so that they can appropriately prepare and respond to the consequences of flooding before those consequences are apparent. Flood warning is potentially a highly effective and relatively cheap means of ensuring public safety and reducing flood losses, because it allows people adequate time to

evacuate and to lift or remove contents (Handmer & Smith, 1995). Many recent studies have suggested that flood warning systems are not performing to their full potential (Gissing, 2002; Pfister, 2002; Anderson-Berry, 2002; Opper et al., 2006; Gissing et al., 2008; Keys and Cawood, 2009). It is a challenge to all emergency managers to ensure that warning systems are effective, and this requires considerable planning and maintenance.

The importance of warnings as a method of protecting life and property was demonstrated on Black Saturday, 2009 and became a key theme of the Victorian Bushfires Royal Commission, with its key conclusion that timely and accurate warnings may save lives (Victorian Bushfires Royal Commission, 2009). The views of the Commission are best summarised below:

*“The evidence before the commission has demonstrated that the community depends on (and has come to expect) detailed and high quality information prior to, during and after bushfires. In addition, the community is entitled to expect to receive timely and accurate information whenever possible, based on the intelligence available to control agencies.”* (Victorian Bushfires Royal Commission, 2009, p 120).

It might be noted here that after many disaster episodes over the past decade or so, great community concern has been expressed about the lack of warning provided or the inadequacy of the warnings that were promulgated. Examples include the tragic Sydney-Hobart Yacht Race in 1998, the Sydney hailstorm in 1999, the North Coast floods in NSW in 2001, the Canberra bushfires in 2003 and the Queensland floods in 2008. Indeed, community concern about warning is a constant theme in the Australian emergency management experience.

Community education is an essential part of any flood warning system as there is a positive linkage between community preparedness and warning systems. Well-prepared communities respond better to emergency warnings and improve the effectiveness of these systems. The Victorian Bushfires Royal Commission's conclusion could equally apply to flood warnings:

*“The success of specific bushfire warnings partly depends on the standard of the information and education provided to the community prior to its issue.”* (Victorian Bushfires Royal Commission, 2009, p 120)

Keys and Cawood (2009) have argued that most weaknesses in Australian flood warning practices are cultural rather than technical, with flood warning products under-used by a combination of poor attention given to flood warning practice and a response-biased (as distinct from preparedness-focused) culture in which proactive flood emergency management is not valued. Flood emergency management agencies should continue to enhance their management capabilities by focusing on the proactive management of potential flood consequences.

There is a growing demand for web-based emergency information and warnings, since the internet has become an important and widely available source of information before, during and after emergencies. In 2006-07, 64% of Australian households had internet access in their homes (ABS, 2008). A growing proportion of internet availability is through mobile phones. Around 50% of respondents in a recent Victorian flood survey indicated they would search for information about flooding on the internet (Molino, 2009).

Social media websites such as Twitter, Facebook, Youtube and the like are increasingly being identified as means of providing information before, during and after emergencies. These new media provide emergency managers the opportunity to communicate directly with the community and for community members to engage with each other on emergency management matters. Depending upon the specific social media they can be used in direct one-way engagement or in a two-way communication flow.

A national telephone-based warning system (Emergency Alert), capable of alerting communities either by a recorded voice message or text message based upon an intended recipient's billing address, is currently being implemented. As the system only has the realistic capacity of providing alerts with limited information there will be a need for people to seek further information either via the media, though telephone hotlines or the internet, again placing a greater requirement on the websites of emergency services to have adequate capacity; and timely, helpful and accurate information and advice available.

## Future directions

### Adopting technological advances



National telephone-based warning system – Emergency Alert.

Flood emergency management agencies should continue to investigate and, where current or emerging needs are satisfied, make use of technological advances. Current emerging technologies which flood emergency management agencies are investigating or implementing include:

- Improved computer-based incident management systems to provide operations controllers with improved awareness of flood situations
- Spatially-based flood intelligence systems to help flood managers become aware in advance

of likely flood consequences and thus to inform flood emergency planning activities and response operations. At present in Australia, even basic flood intelligence systems (in short, systems which contain information on the likely effects of floods in specified areas under conditions of varying flood severity as measured, for example, by river heights at gauges) are poorly developed in some jurisdictions. There is scope for much improvement both in data (by using information from past floods and from modelling) and display (for example in the utilisation of modern Geographic Information Systems), and for increases in their use in the provision of flood warnings.

- Temporary flood mitigation devices to protect property, critical infrastructure and heritage assets
- Warning technologies to provide additional warning tools including the implementation of the National Emergency Warning System (Emergency Alert). Opportunities also exist to improve the efficiency with which warnings are issued across multiple mediums, through the adoption of technology, which enables emergency managers to disseminate a consistent warning message through multiple mediums through simple software solutions. Mediums include the broadcast media; telephone-based warning systems; social media (Twitter etc.); websites etc.
- Increased use of remote sensing and aerial technologies to collect real-time flood information to improve situational awareness

### Improving flood warning systems and community flood preparedness

Much can be done to improve flood warning system performance and community flood preparedness and a high priority should be given to such improvements by emergency and floodplain management agencies. There is considerable evidence of the economic value of flood warning systems and community flood preparedness to support a high priority being given to this area (Molino Stewart, 2009). It is essential that emergency management agencies provide specific resources for education, emergency planning and warning to improve these areas and adopt a proactive flood emergency management culture.

Potential future flood warning advances will depend on the following issues being addressed:

- Recognition of the importance and value of warning systems
- Security and maintenance of existing flood warning infrastructure including stream flow gauges
- Investigation of the need for improved flash flood warning systems and means of developing them
- Ensuring community and media awareness of flood warning products and appropriate means of responding to them
- Continued development of pre-written flood bulletin templates to improve the accuracy, comprehensiveness and timeliness of warning messages
- Improved use of websites and social media to disseminate flood information and warnings
- Improved use of graphics in flood warning products to provide more information and improved community understanding in relation to flood consequences

- Improved capability to provide warnings and information in languages other than English
- Ensuring flood intelligence is available for warning gauges so that likely flood consequences can be identified and communicated to the community
- Improved dissemination of warnings, through community networks, to vulnerable groups who maybe isolated within society
- Linkage of spatial flood intelligence to the National Emergency Warning System (Emergency Alert)
- Cultural change in information units (units established to coordinate public information) to provide a focus on proactively warning the community about flood threats

Key potential future community education issues include:

- Continued research into the effectiveness of different community engagement methods to ensure that the most effective methods are utilised
- Building capability amongst SES volunteers to conduct community education
- Ensuring that community education programs are risk-based, containing locally- based information
- Ensuring community education programs are accessible to the community, including to culturally and linguistically diverse communities and to disability groups
- Development of enhanced strategies, in partnership with road safety organisations and road owners, to reduce the instances of people walking, riding or driving through floodwater
- Partnering with other emergency service and hazard management agencies to provide all hazards community education programs
- Renewed focus on school based community education, particularly around the dangers of floodwaters
- Using websites to deliver self paced business and household planning tools

Flood emergency planning aims to prepare community-based plans of action to guide the preparedness, response and recovery phases of flood emergency management. These plans are a key to ensuring emergency management and community preparedness for floods. More can be found about the importance of flood emergency planning and emergency planning processes in Gissing et al (2007). Key issues in this area include:

- Ensuring adequate community and stakeholder consultation within the emergency planning process
- Ensuring plans are risk-based and are developed using appropriate and easily- understood flood information
- Developing an understanding of communities to ensure plans reflect likely community behaviours during floods
- Building capability on the part of flood emergency planners to understand flood risk information and how to plan for flood emergency management strategies
- Convincing response-orientated emergency managers of the need for emergency planning (and the need to utilise plans when responding to floods)

- Ensuring flood emergency plans are kept alive through exercising and training and that all agencies with responsibilities under the plans maintain operational readiness for flooding
- Greater incorporation of critical infrastructure consequences into flood intelligence and flood emergency plan strategies
- Improved planning for large scale flood rescue operations.

Evacuation modelling developed by the NSW SES (Opper et al, 2009) is available for use to estimate the amount of time required to evacuate communities at risk of flooding. Evacuation modelling is essential in ensuring timely evacuation decisions are made to enable everybody to escape the area of danger in time. Evacuation modelling can also be used to assist floodplain management agencies in assessing whether a development proposal can be safely evacuated given the constraints of the likely warning time and evacuation routes available and without causing significant negative consequences on the evacuation capacity of the pre-existing community.

### **Promotion of best practice flood emergency management principles**

Recently the National Flood Risk Advisory Group, with the assistance of S/SES agencies, completed the review of the Australian Emergency Manual Flood Series originally published in 1999. The series promotes flood emergency management best practice principles in flood emergency management and includes comprehensive manuals on Flood Preparedness, Flood Response, Flood Warning and Emergency Management Planning for Floods Affected by Dams (available from [www.ema.gov.au](http://www.ema.gov.au)). These manuals should be seen as critical in collecting and promoting industry best practice, but to succeed in actually improving the quality of flood emergency management the manuals must be marketed to emergency and floodplain managers and integrated into training and exercising practices.

It is essential to invest in the knowledge and expertise of emergency managers. Though there are successful initiatives such as the NSW SES's Exercise Nevagazunda, the NSW DECCW/UTS Floodplain Management course and VICSES's Managing Floods Using AIIIMS course there exists a need for more formalised training to educate and exercise practitioners in best practice flood emergency management concepts and principles.

### **Improving relationships between flood emergency, flood warning and floodplain management agencies**

Over the last decade, the relationships between floodplain management, flood warning and flood emergency management agencies have grown stronger. The importance of these relationships must be recognised across the contexts of prevention, preparedness, response and recovery. Effective relationships have mutually beneficial outcomes. For those involved in managing floods there is an improved



**A key to future directions is maintaining and building the relationships between agencies.**

opportunity to gain essential data from flood studies to inform flood intelligence and to use the knowledge of floodplain managers in informing flood response operations and flood warning. For floodplain managers there is an opportunity to gain emergency management and warning input into land use planning and floodplain management initiatives; and to partner in the delivery of community flood awareness programs. It is essential in ensuring effective service delivery that relationships between industry sub-groups continue to grow and strengthen.

## Conclusion

Much can be done by emergency, warning and floodplain managers to address the key industry challenges and trends assuming appropriate resources are available. A primary key to future directions is maintaining and building the relationships between flood emergency, flood warning and floodplain management agencies, particularly in sharing the expertise the industry sub-groups can provide.

Cultural change within the emergency management agencies, especially the S/TEs, is critical to ensure that emergency and floodplain managers recognise the importance of warnings, intelligence and emergency planning. Further engagement is required to ensure stronger partnerships are developed between emergency, warning and floodplain management agencies and between agencies and the community. These elements are the keys to building a strong culture of community-based flood resilience in the future. Many of the tools for better flood management are well understood, but a major challenge will be to improve our adoption and utilisation of them in the search for a greater degree of community resilience against the flood hazard. The legacy of the current generation of flood managers will depend on how well we perform this task.

## Acknowledgements

The authors wish to thank Hori Howard and John Handmer for helpful comments on the first draft of this paper.

## References

- Anderson-Berry, L.** (2002). *Flood Loss and the Community*. In: Smith, D.I & Handmer, J. (Eds), *Residential Flood Insurance The Implications for Floodplain Management Policy*. Water Research Foundation of Australia, Canberra.
- Australian Bureau of Statistics** (2007) *Household preparedness for emergencies*. Available online [www.abs.gov.au](http://www.abs.gov.au).
- Australian Bureau of Statistics** (2008) *Social Trends 2008*. Available online [www.abs.gov.au](http://www.abs.gov.au).
- Australian Government Department of Climate Change** (2009) *Climate Change 2009 – Faster & More Serious Risks*. Australian Government Department of Climate Change. Available online [www.climatechange.gov.au](http://www.climatechange.gov.au)
- Australian Government Department of Climate Change** (2009) *Climate Change Risks to Australia's Coast*. Australian Government Department of Climate Change. Available online [www.climatechange.gov.au](http://www.climatechange.gov.au)
- Bureau of Transport Economics** (2002) *Costs of Natural Disasters in Australia*. Bureau of Transport Economics, Canberra
- CSIRO** (2006) *Climate Change Impacts on Australia and the Benefits of Early Action to Reduce Global Greenhouse Gas Emissions*. CSIRO
- CSIRO and Australian Government Bureau of Meteorology** (2007) *Climate Change in Australia*. Available online – [www.climatechangeinaustralia.gov.au](http://www.climatechangeinaustralia.gov.au)
- Gissing, A.** (2002). 'The business of warning', *Risk Frontiers Quarterly*. Available online [http://www.es.mq.edu.au/nhrc/web/nhq/rfnews1\\_3/rfnews1\\_3tables.htm](http://www.es.mq.edu.au/nhrc/web/nhq/rfnews1_3/rfnews1_3tables.htm).
- Gissing, A.** (2003) *Flood Action Plans –making loss reduction more effective in the commercial sector*. The Australian Journal of Emergency Management No 3. pp. 46-54.
- Gissing, A., Morgan, M., and Ronan, C.** (2007) *Planning for the inevitable – emergency planning for floods in NSW*. Presented at 2007 Floodplain Management Authorities Conference, Gunnedah.
- Gissing, A., Molino, S. and Cameron-Smith, C.** (2008) *How do you improve community response to warnings*. Presented at 2008 Floodplain Management Authorities Conference, Wollongong.
- GNS** (2007) *Flood risk perceptions, education and warning in four communities in New South Wales, Australia – results of a questionnaire survey, 2005*. GNS Scientific Report 2007/30.
- Handmer, J. & Smith, D. I.** (1995). *Cost-Effectiveness of Flood Warnings, Volume 2, Assessing Flood Warnings*. Report prepared for the Bureau of Meteorology. Centre for Resource and Environmental Studies, ANU, Canberra.
- Hunter-Central River Catchment Management Authority** (2005) *Flood Education Advisory Committee Survey*. Hunter-Central River Catchment Management Authority

**IPCC** (2007) *Climate Change 2007*.  
Available online - [www.ipcc.ch](http://www.ipcc.ch)

**Keys, C. and Cawood, M.** (2009) *Identifying and reducing the inadequacies in flood warning processes: an Australian perspective*. *Journal of Flood Risk Management*, Vol 2, Number 3, pp. 190-197.

**Molino, S.** (2009) *Unifying Flood Information – The Victorian Flood Web Portal*. Presented at 2009 Floodplain Management Authorities Conference, Albury.

**Molino Stewart** (2008) *Evaluation of the FloodSmart and StormSmart pilot programs and their transferability to the urban environment*. Prepared for the Victorian State Emergency Service.

**Molino Stewart** (2009) *Community Education for Floods and Storms Cost Benefit Analysis for VICSES Business Case*. Molino Stewart, Parramatta.

**Opper, S., Gissing, A., Molino, S. and Edwards, G.** (2006) *To flee or not to flee – an evaluation of warning and evacuation effectiveness*. Presented at 2006 Floodplain Management Authorities Conference, Lismore.

**Opper, S., Cinque, P., Davies, B.** (2009) *Timeline modelling of flood evacuation operations*. Presented at First International Conference on Evacuation Modelling & Management, Netherlands

**Pfister, N.** (2002). 'Community response to flood warnings: the case of an evacuation from Grafton'. *Australian Journal of Emergency Management*, Vol 17, No 2.

**Victoria State Emergency Service** (2008) *Maribyrnong flood survey*. Unpublished

**Victoria State Emergency Service** (2009) *Operational and Communication Effectiveness Survey*. Jobshift Pty Ltd, Melbourne

**Victorian Bushfires Royal Commission** (2009) *Interim Report*. Parliament of Victoria, 2009 Victorian Bushfires Royal Commission

**Victorian Government** (2008) *Climate Change Victoria: 2008 Summary*. Victorian Government.

**Victorian Government** (2009) *Victorian Climate Change Green Paper*. Victorian Government.

**Wright, C. & Smith, D** (1999) *How to capture the benefits of flood warning*. Proceeding Australian Disaster Conference 1999.

## About the authors

**Andrew Gissing** is Director Emergency Management and Communication, VICSES. Andrew provides leadership of the Victoria SES's emergency management functions relating to community education and communication strategies. He is an Honorary Associate of Risk Frontiers and Macquarie University, where he completed a Bachelors Degree in Economics and a Masters (Honours) Degree in Science. He may be contacted at [andrew.gissing@ses.vic.gov.au](mailto:andrew.gissing@ses.vic.gov.au).

**Chas Keys** is a Flood Consultant. Chas has written a number of books and several articles on emergency, flood and floodplain management since his retirement from the NSW SES in 2004 and led the recent review of the Australian Emergency Management Manual Flood Series. He has a PhD degree from the University of Alberta (Canada) and is an Honorary Associate of Risk Frontiers. He may be contacted at [chas.keys@keypoint.com.au](mailto:chas.keys@keypoint.com.au).

**Steve Opper** is Director of Emergency Risk Management, NSW SES. Steve is responsible for the NSW SES's state-wide planning and education programs for floods, storms, and tsunamis, and is designated as a State Controller for response operations. He has a Graduate Certificate in Applied Management. He may be contacted at [steve.opper@ses.nsw.gov.au](mailto:steve.opper@ses.nsw.gov.au).

R

# Paramedics and public health emergencies: Is there a 'duty to respond' in Australia?

Smith, Burkle Jr, Woodd, Jensen, and Archer examine the concept of 'duty to respond' in the Australian SARS context.

## ABSTRACT

As evidenced by Toronto's experience with Severe Acute Respiratory Syndrome (SARS), paramedics provide an integral 'frontline' role during a public health emergency. During normal operating procedures paramedics understand their 'duty of care' to individual patients. However, is there a 'duty to respond' when the point of care moves from the individual patient to the greater population during a public health emergency? An extensive search of publicly available state and national legislation and regulations was conducted to examine the concept of 'duty to respond' in the Australian context. Relevant Emergency Management Acts, Health Acts, and ambulance service regulations lacked a clear focus on 'duty to respond' and failed to address the ramifications of paramedic refusal to work. As Australia is a Common Law Country the issue of duty to respond could be managed through paramedics' individual employment contracts with their respective ambulance services, and failing to respond could potentially be addressed using pre-existing standard terms and conditions for employment. This issue is particularly topical in light of the current public health challenge posed by the Swine

and psychological effects such as anxiety, neuroses and depression (Hooke 2001). These health risks were highlighted by the exposure, infection, illness, and death of paramedics and emergency health care staff during the Severe Acute Respiratory Syndrome (SARS) outbreak in 2003 (Maunder 2004). SARS exposed the vulnerabilities of our health care systems, where health care workers (HCWs) bore the brunt of the outbreak and were the most at risk population for SARS, accounting for 21% of all cases worldwide (WHO 2003).

Public health emergencies place unprecedented demands on the health care system regarding surge capacity and test HCWs' personal commitment to the health care profession. Despite this challenge, professional codes of ethics and health services management guidelines are largely silent on the issue of duty to respond during public health emergencies, thus providing no guidance on what is expected of HCWs, or how they ought to approach their duty to care and respond in the face of risk (Ruderman 2006). In the context of the current pandemic of Swine Influenza it is imperative that health care agencies, including ambulance services, consider the responsibilities and 'duty to respond' of their employees, and give a clear indication of what standard of care is expected in the event of a public health emergency.

## Methods

A comprehensive literature search was conducted for all publicly available information relating to paramedic responsibility to work in Australia. The electronic databases MEDLINE (1950 to February 2009) and CINAHL (1982 - February 2009) were searched using variations of the search terms 'duty to work', 'duty to respond', 'responsibility to work', 'obligation to work' and 'professional responsibility' in combination with variations of the search terms 'public health', 'public health emergency', 'public health disaster' and 'public health crisis'. Findings were limited to studies of paramedics in the Australian context. The Google, Google Scholar, and Yahoo Search Engines were also searched, along with the Emergency Management Australia (EMA) website, individual Australian ambulance service websites, national and state government and affiliated websites, and the Australian College of Ambulance Professionals (ACAP) website.

The continuing threat of both naturally emerging and man-made public health emergencies has brought the issue of emergency health care workers' responsibilities and duty to respond into question. These questions are complicated by the potential risk that emergency health care workers face during the frontline response to such health disasters. As a core component of the frontline response, paramedics are at high risk for a variety of health and injury risks, including physical injury, death, communicable disease, contamination,



## Results

The literature search of MEDLINE and CINAHL identified no relevant publications addressing Australian paramedic duty to respond during public health emergencies. Individual agency websites provided the most useful resources relevant to the issue of health care worker duty to respond, including Emergency Management Acts, Health Acts, and ambulance service guidelines. A national and state-by-state summary of findings is provided below.

### National

At a national level, legislation and regulations governing and outlining paramedic responsibility and 'duty to respond' during disasters are lacking. The role and responsibilities of paramedics are not outlined in the National Health Act (1953), and no national ambulance guidelines exist to outline the responsibility of paramedics during a disaster, or the ramifications of failing to respond to work. The National Health Security Act (2007) specifically addresses communicable disease outbreaks however the role of Ambulance Services is not outlined. The Australian Health Management Plan for Pandemic Influenza (2006) outlines the role of the ambulance services during a pandemic, but fails to specifically address paramedic responsibilities or obligations. The Quarantine Act of 1908 states that the Commonwealth has pre-eminent powers over all matters of human quarantine, in which case national health responses would be dictated by the Commonwealth. Finally, the Australian College of Ambulance Professionals (ACAP) have a "Code of Professional Conduct" which outlines how Australian paramedics are required to conduct themselves in relation to integrity, respect, responsibility (no specific guidance as to professional obligation), competence, gaining consent for patient care, confidentiality, research, and ethical review.

### Victoria

Ambulance Victoria (AV) is the only ambulance service within Australia that is a separate statutory body from the state government. The Victorian Ambulance Service Act 1986 details AV's 'duty to care' through the services' day-to-day functions, objectives and responsibilities. Despite not being a governmental agency, AV still complies with directions given by, and reports directly to, the Minister for Health (s34B). There appears to be no specific area that addresses the consequences of a paramedic refusing to work, whether disaster-related or not. Furthermore, there is no reference of additional responsibilities that may be placed upon the service in the event of a state disaster.

Within AV, the Metropolitan Ambulance Service (MAS) has developed the MAS Emergency Response Plan (2007) with the aim of coordinating the effective management of emergency health situations. While this plan does not specifically cover the issue of responsibility to work, it does outline response and recovery activities, which appear similar to those of general 'core business' ambulance response activities in the Ambulance Service Act (Victoria). It also aims to

ensure AV plays an integral role in the management of a health incident by providing leadership, and command to the other health agencies, and is consistent with the State Health Emergency Response Plan (SHERP). SHERP is the umbrella plan which encompasses all other health and medical plans in Victoria.

The Victorian Emergency Management Act 1986 operates in conjunction with SHERP and the Emergency Management Manual Victoria 2008 (EMMV) to provide an effective state-wide health response framework. These Acts and plans focus on the coordination of prehospital emergency service agencies specific roles and responsibilities in the event of an emergency. In Victoria, the Department of Human Services (DHS) is primarily responsible for incident control and the overall coordination of these plans. The ambulance services, in addition to maintaining normal business continuity, will assume prehospital leadership and coordinate patient triage, treatment and transport. Additionally the ambulance services will partnership with DHS to communicate with medical specialist teams, notify hospitals and other emergency teams. Paramedic responsibility to work is not explicitly covered in any of these plans.

Victoria's Health Management Plan for Pandemic Influenza (2007) aims to minimise the morbidity and mortality associated with a pandemic and includes strategies such as preparedness, containment and maintenance of social function. The plan outlines that ambulance services will liaise with the DHS in an effort to reduce to spread of infection. The safety of ambulance officers is considered paramount, with immunisation strategies, staff education and personal protection equipment (PPE) procedures outlined. The protection of staff in this document is consistent with the Health Act 1958 (Victoria) which instructs that all persons at risk of contracting or spreading infectious diseases must take all possible precautions to prevent the risk to others (s119). However, again, paramedic responsibility to work is not covered in this plan.

### Australian Capital Territory

Ambulance services in the Australian Capital Territory (ACT) are provided by the ACT Emergency Services Agency, a division of the Department of Justice and Community Safety. The ACT Ambulance Service Union Collective Agreement (2007 – 2010), provides the terms and conditions of employment for employees. This agreement recognises an employee's commitment to family, the community, and general health and wellbeing (s53.2) and is committed to providing employees with a balance that recognises the family and personal commitments of employees (s53.4). This is one of the few plans identified that explicitly states that the ACTAS reserves the right to deny an employee leave where there are operational reasons for doing so (s53.5).

The ACT Health Management Plan for Pandemic Influenza (2007) stipulates the responsibilities of the ACT Government and relevant agencies in the management of a pandemic emergency. The roles and responsibilities outlined in this plan are guided by the ACT Emergencies Act 2004 and the ACT Public

Heath Act 1997. In response to a health emergency, the plan stipulates that the ACT Emergency Services Agency will coordinate the ACTAS to assist in operations where necessary. Of note, the pandemic plan and all legislation in the ACT comes under the umbrella of the Human Rights Act 2004 (ACT). Therefore, providing patient care must not unnecessarily infringe on the fundamental human rights of the paramedic.

The ACT Emergency Act 2004 is linked with the ACT Emergency Management Plan and gives directive to the Ambulance Commissioner for the legislative power to access inter-jurisdictional and national resources (s147-149). A specific role of the ACTAS is not clearly defined and is at the directive of the Chief Ambulance Officer. However, it is expected that ambulance services will continue to provide provision of medical treatment and prehospital patient care, and includes the transport of a patient by ambulance or medical rescue aircraft (s 41). The general consensus of this Act is that during a pandemic emergency, compliance to Ambulance Service directives is expected, however legislative powers and penalties may apply if paramedics fail to comply.

### **New South Wales**

The Ambulance Service of New South Wales (ASNSW) is a Government-run organisation through the NSW Department of Health. The NSW Ambulance Services Act 1990 details the operational responsibilities of the ASNSW which governs the core business of paramedics. Disciplinary action upon paramedics who fail to comply with contractual obligations is at the directive of the ASNSW and state Governor. Actions of the ASNSW beyond those described within this Act are guided by Acts such as the Health Services Act 1997 (NSW) and the State Emergency and Rescue Management (SERM) Act 1989. Additionally, the Service is also subject to the NSW Disaster Plan (DISPLAN), NSW Healthplan, and the NSW Health Interim Influenza Pandemic Action Plan (November 2005).

The State Emergency and Rescue Management (SERM) Act 1989 is the principle planning instrument for all emergency management within NSW. However, the SERM Act fails to outline a specific role for ambulance services during a declared state emergency. Nevertheless, the NSW Healthplan, DISPLAN, and Pandemic Action Plan are all prepared in accordance to this Act, and each Emergency Service agency maintains similar roles and responsibilities in terms of emergency and disaster preparedness, response and recovery.

In the event of a large scale infectious disease emergency the NSW Healthplan is activated along with the NSW Health Interim Influenza Pandemic Action Plan (November 2005). Within these plans, the State Ambulance Controller is responsible for the coordination of ambulance services to provide emergency response, recovery and maintenance of core ambulance services. These plans do not document the legal ramifications of paramedics failing to work. Disciplinary action resulting from paramedics refusing to comply or act in the event of declared emergency appears to be limited to the decision of internal processes or at the decree of the State Governor.

### **Queensland**

The Queensland Ambulance Service (QAS) is a division of the Department of Emergency Services within the Queensland Government. According to the Ambulance Service Act (Queensland) of 1991, the role of the QAS in the event of an emergency or disaster is to participate with other emergency services in counter-disaster planning, coordinate volunteer first-aid groups, and maintain normal duties and functions. The Ambulance Commissioner has the power to discipline paramedics upon the failure to comply with the QAS code of practice, which may result in disciplinary action (s41). However, paramedics may also take any reasonable measure to protect themselves from potential danger from other persons (s38).

The Queensland Public Health Act (2005) binds all professional health care workers to protect and promote the health of the Queensland public. Emergency officers are instructed to respond to all public health emergencies (s314-315) and must take all reasonable precautions to minimise the risk of infection to others (s151). Furthermore, this Act may give paramedic legislative power to use quarantine measures to prevent the further spread of disease in an effort to contain a public health risk (s345). The Queensland Disaster Management Act 2003 established to manage, respond and recover from a national disaster or emergency situation, can be used by the state to provide a response framework for the State Emergency Services. Paramedics are governed by this Act under the Ambulance Service Act 1991 (Queensland).

The Queensland Health Disaster Plan (2008) is to be activated in the event of exceeded operational capacity in response to a health event, in response to legislative activation, or by special consequence (s3). The QAS is required to provide a coordinated response to triage, treat and transport patients, and maintain core ambulance services throughout the state, which may also include the coordination and deployment of volunteer services (s9.2). Paramedic responsibility to work during a health disaster is not outlined in this plan.

### **South Australia**

The South Australian Ambulance Service (SAAS) is an incorporated association established under the state's Minister for Health. The South Australian Ambulance Services Act of 1992 does not explicitly provide information on paramedic duty to respond or responsibility to work. The Act outlines the operation of ambulance services in the state and the existing penalties for operating a service without a licence allocated to them by the minister. The South Australian Emergency Management Act of 2004 outlines that roles of the state emergency management committee and the state coordinator and describes the powers each position holds. The Act also outlines the punishable offences in regards to emergency situations, such as the failure to comply with directions without a reasonable excuse and obstructing operations during a major emergency. Both of these offences could be committed if a paramedic refuses to respond during a disaster.

The State Emergency Services Act of 1987 outlines the state emergency service (SES) board of management and response obligations in certain emergency situations. The Act does not include any information in regards to the duty to respond for emergency officers or paramedics. The South Australian Health Care Act 2008 provided a substantial amount of information on private and public hospitals and the administration, management and operation of them. The Health Care Act also included a large section on the SAAS and explains the management, function and powers of SAAS. However, again there is no information on the duty of a SAAS employee to respond in a disaster situation.

### **Tasmania**

The Tasmanian Ambulance Services (TAS) is a statutory service of the Acute Services Group of the Department of Health and Human Services; however ambulance services in the state are largely voluntary based. The Ambulance Services Act of 1982 outlines the administration and management of ambulance services in the state. The Act does not explicitly outline the roles of paramedics in disaster situations or the consequences if specific roles are refused. The Tasmanian Emergency Management Act of 2006 outlines the administration processes for emergencies at both state and regional levels. The act explains how the emergency management plans of each area are instigated and when and how a state of emergency is declared. In regards to paramedic's responsibility to work, and duty to respond during emergencies and disasters, there is no information or explanation of penalties. The Tasmanian Health Act of 1997 also fails to provide information regarding the duty of ambulance personnel to respond.

Tasmanian Ambulance Service officers are subject to the provisions of the State Service Act of 2000 (Tasmania) in which disciplinary actions, up to termination of employment, may be imposed upon inability to perform duties of upon a breach of the Code of Conduct (s10). The Tasmanian Action Plan for Human Influenza Pandemic (2008) does not specifically mention the role of TAS however the Department of Health and Human Services is expected to coordinate a pandemic response and it can be assumed that TAS role would be incorporated here.

### **Western Australia**

Ambulance services in Western Australia are provided by St John Ambulance and are a not-for-profit organisation under contract by the Western Australian Government. The Western Australian Emergency Management Act of 2005 in which the ambulance service is classified as a combat agency, defines the State Emergency Management Committee functions and powers as well as the administrative side of the committee. While the Act addresses the roles of key health care personnel it fails to specifically describe the roles of the ambulance paramedic and the ramifications of failure to respond to work. However the Act does explain the offences which are punishable in a state of emergency such as failure to comply with direction of a management officer or obstruction of a management officer. A paramedic failing to respond to work could possibly be included here under 'failure to comply'.

The Western Australia Health Act of 1911 outlines information on the administration and management of the public health system, however, it does not discuss the role of paramedics or any penalties associated with failure to respond. The Fire and Emergency Services Authority Act of 1998 is somewhat ambiguous in the classification of 'paramedic'. It is unclear whether a paramedic is incorporated within the Fire and Emergency Service Authority (FESA) unit, which defines a FESA unit as being trusted with the protection and saving of life endangered by incidents. There is no specific definition of the roles of each emergency service in an emergency or disaster and nothing is outlined in regards to the duty to respond for paramedics or any emergency service employee.

### **Northern Territory**

The Northern Territory Government has adopted a similar approach to WA, wherein ambulance services are provided by under contract to the NT Government by St Johns Ambulance Services. The Northern Territory do not have an ambulance services Act, however they do have a Disasters Act. The Northern Territory Disasters Act of 2008 explains the administration and powers that the counter disaster council has, and when these powers can be used. The Act also outlines the role of the disaster controller and director of emergency services in the Northern Territory. This Act also outlines the penalties involved with failing to comply with, or obstructing an officer working under the Act. Under this Act, paramedics may potentially be liable to prosecution for failing to comply with orders if they refuse to report to work. The Emergency Management Plan for Northern Territory defines specific operations in which the ambulance services will be involved in and their objective as part of these operations. However, again there is no mention of paramedic responsibility, or ramifications of failure to respond to duty. Finally, the Northern Territory Notifiable Diseases Act of 1999 fails to address the issue of paramedics and their duty to respond during an outbreak disease.

### **Discussion**

Responding to public health emergencies has historically threatened the health and safety of emergency health care workers. The SARS outbreak of 2003 demonstrated the risk to health care workers of naturally occurring outbreaks (Bradsher 2003, Reilley 2003), and more than one third of treating health care workers were contaminated and became ill during the response to the Sarin gas attack in Tokyo (Department of Health and Human Services 1996). Health care workers are common second-wave victims of Ebola outbreaks (Sepkowitz 1996), and many health care professionals have become exposed to infections such as Human Immunodeficiency Virus (HIV), Hepatitis B or C, and drug-resistant tuberculosis (Centers for Disease Control 2001). It is clear that public health emergencies will continue to occur and that being a health care worker can sometimes directly impact on health and well being (Huber 2004).

### **What did we learn from SARS?**

During the SARS outbreak of 2003, the infectiousness of SARS was substantially higher among health care workers than the general population, especially those working in hospitals and prehospital care (Maunder 2004). Indeed, during the SARS outbreak, Toronto, which had 224 confirmed SARS patients, suffered significant personnel and logistical problems in providing prehospital services to patients during the outbreak (Maguire 2007), with approximately half of Toronto's prehospital personnel exposed to the disease, and many workers needed to be quarantined (Silverman 2004). During the first phase of the SARS outbreak (officially declared over by the World Health Organisation on May 14, 2003), 234 paramedics were placed on home quarantine. During the five peak days of the SARS outbreak, paramedics spent a total of 664 days in home quarantine (Verbeek 2004). Based on the number of paramedics unavailable due to home quarantine during the first phase of the SARS outbreak, when the second phase of the outbreak occurred (reported on May 23, 2003), a work-based quarantine program was developed to optimise paramedic availability to work (Verbeek 2004).

Following the SARS outbreak, staff involved in the medical care of SARS patients reported being fatigued, concerned about their own health and the health of their family, and developed a fear of social contact (Chua 2003, Koh 2005). Health care workers believed that they were at high risk of becoming infected, with some refusing to care for the ill and imposing self-quarantine on themselves to protect family members from potential exposure (Stein 2004). These behaviours are reminiscent of the psychosocial reactions witnessed during the beginning of the AIDS epidemic, where healthcare workers refused to treat patients, avoided physical contact with potential AIDS patients, and self-imposed isolation and quarantine measures to prevent 'spreading' the disease to loved ones (McCann 1997, Stein 2004).

### **Ethical considerations and professionalism**

The ethical foundations of "duty to care" and "duty to respond" are grounded in several longstanding ethical principles. Foremost among these is the principle of beneficence, which recognises and defines the moral obligation on the part of health care workers to further the welfare of patients and to advance patients wellbeing (Ruderman 2006). Beneficence is commonly accepted in modern health care and constitutes a foundational principle of the patient-professional relationship (Entralgo 1995). This is where the issue of professionalism comes into play. Are paramedics considered to be health care professionals in Australia if they are not a registered health care body? And if not, are they exempt from the ethical issues associated with beneficence?

The issue of professionalism is also relevant to the discussion of codes of ethics. One of the characteristics of a regulated health care profession is the development of regulations and standards which are developed on the basis of fundamental ethical principles and values of that profession. As Ruderman et al (1996) highlight, "the code of ethics has a long

and respected tradition in the health professions and today, most, if not all, the various health and social care professions have codes of ethics in place to provide guidance to their members". However, Campbell et al (2000) argue that the existence of codes of ethics equals nothing more than "soft laws", owing to the non-legislative and non-enforceable nature of the code.

It is also of concern that many current professional codes of ethics fail to provide explicit guidance regarding professional responsibilities during public health emergencies. The Canadian Medical Association (CMA) released a revised Code of Ethics one year after the SARS outbreak in 2004 (CMA 2004). The Code is largely silent on the issue of "duty to respond" despite their direct experience with managing the SARS outbreak. One key revision of the 2004 code was the inclusion of a "Fundamental Responsibilities" section. This section fails however to substantively address the issue of "duty to respond" during public health emergencies and lacks clear guidance to health care workers regarding their rights and responsibilities.

The American Medical Association (AMA) reviewed their professional code of ethics in the wake of the September 11th terrorist attacks. The AMA included several new ethical policies in their code that focus specifically on the medical profession's responsibilities and obligations in the context of a public health emergency. Under "Physician Obligation in Disaster Response" the AMA code directs "because of their commitment to care for the sick and injured, individual physicians have an obligation to provide urgent medical care during disasters. This ethical obligation holds even in the face of greater than usual risks to their own safety, health or life" (American Medical Association). While the AMA has moved in the right direction by outlining professional obligation, it fails to transparently detail how failure to comply with these obligations will be managed.

So where does this leave Australian paramedics? Are they a profession? Are they health care professionals? Should they be registered? Are they covered by ethical principles and codes of ethics that govern the patient-professional relationship existing within other professional, registered health care bodies? What are their responsibilities and obligations? It is hoped that this paper will promote a social dialogue of these issues.

### **Can we ethically enforce "duty to respond"?**

There is no current consensus as to how explicit requirements for "duty to respond" should be (Singer 2003). Enforcing "duty to respond" would echo previously discarded policies from codes of ethics which clearly stipulated that physicians have a duty to care even in the face of risk to their own life. Is this reasonable? Furthermore, is this ethical? This type of policy would likely be viewed as unacceptable in current thinking as it infringes on personal liberties. Clark (2005) suggests that forcing professional obligations such as "duty to respond" on health care workers is akin to requiring them to behave like "supreme Samaritans". The ever-present threat of emerging public health disasters demands a transparent discourse regarding the

acceptable standard of professional engagement, whether that be at the level of “supreme”, “good”, or “merely decent” Samaritans (Clark 2005, Ruderman 2006).

### The registration debate

At present, Australian paramedics are not registered health care professionals. Ignited by the Australian Federal Government's moves to develop a unified national registration scheme for health professionals (COAG 2008), the issue of paramedics being registered as a professional body is now being debated. O'Meara (2009) suggests that a number of key issues regarding paramedic professionalism and registration require exploration, for example, social and technological changes have contributed to the increasing complexity of paramedic practice, requiring the development of enhanced professional knowledge and skills. Furthermore, the utilisation of these advanced skill sets in the pre-hospital environment potentially exposes paramedics to a much broader range of environmental and occupational risks. Paramedic practice has changed from “... a relatively simple response based, non invasive series of activities that ended at the hospital door to a much more complex practice based upon judgement and problem solving” (Sheather 2009). Within this context, questions surrounding paramedic responsibilities and obligations need to be discussed amongst policy makers, employers and the profession, so that any expected “duty to care” and “duty to respond” is transparent.

### Conclusion

In light of what we learned from the SARS outbreak of 2003, and in the present reality of a Swine Influenza Pandemic, it is imperative for ambulance services to consider the professional responsibilities of paramedics in regards to responding to public health emergencies, particularly when that response can result in exposure, infection, illness, and death. It is of critical importance that ambulance services give paramedics clear guidance relating to what standard of care is expected of their employees in the event of a public health emergency, and what the ramifications of failure to respond will be.

This literature review identified little or no clear guidance addressing Australian paramedic duty to respond during public health emergencies, or the ramifications of failing to respond. As Australia is a Common Law Country, the issue of paramedic responsibility and duty to respond would presumably be managed through individual paramedic employment contracts with their respective ambulance services, and failing to respond could be managed using pre-existing standard terms and conditions for employment. Under such circumstances, the ambulance services would need to demonstrate that the direction to respond was appropriate. A critical examination of the role and responsibilities of paramedics during public health emergencies is needed in order to provide guidelines detailing professional obligations and responsibilities, as well as rights of the paramedic to decline to respond.

### References

- ACT Ambulance Service Union Collective Agreement** (2007 – 2010). Department of Justice and Community Safety, Canberra, Australian Capital Territory. Available from: <http://www.sharedservices.act.gov.au/docs/agreements/>
- 
- ACT Health Management Plan for Pandemic Influenza** (2007), Department of Health, Australian Capital Territory Government, Canberra, ACT. Available from: <http://www.health.act.gov.au/c/health?a=da&did=10106839>
- 
- Ambulance Services Act**, 1990, NSW [Amended 2006 March 17]. Available from <http://www.austlii.edu.au/>
- 
- Ambulance Service Act**, 1991. QLD [Amended 2008, March 20]. Available from <http://www.austlii.edu.au/>
- 
- Ambulance Service Act**, 1992. SA [Amended 2005, July 14]. Available from: <http://www.austlii.edu.au/>
- 
- Ambulance Service Act**, 1982. TAS [Amended 1997, February 1]. Available from <http://www.austlii.edu.au/>
- 
- American Medical Association: Physician Obligation in Disaster Preparedness and Response.** [http://www.ama-assn.org/apps/pf\\_new/pf\\_online?fn=browse&doc=policyfiles/HnE/E-9.067.HTM](http://www.ama-assn.org/apps/pf_new/pf_online?fn=browse&doc=policyfiles/HnE/E-9.067.HTM)
- 
- Australian Health Management Plan for Pandemic Influenza** (2006), Department of Health and Ageing, Australian Government. Available from: <http://www.health.gov.au>
- 
- Bradsher K.** *The SARS Epidemic: The Patient; Hong Kong Doctor's Ordeal as Patient with New Disease.* The New York Times 2003;26 April:A1
- 
- Canadian Medical Association (CMA): CMA Code of Ethics,** Ottawa 2004
- 
- Centers for Disease Control (CDC).** *Update: US Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV and HIV and Recommendations for Postexposure Prophylaxis.* MMWR 2001;50(RR11):1-42
- 
- Chua S, Cheung V, Cheung C.** *Stress and psychological impact on SARS patients and high-risk health care workers during SARS outbreak.* Hong Kong: Department of Psychiatry, University of Hong Kong, 2004. Available at: <http://www.web.hku.hk:8400/facmed/press/-07-20/presentation.pdf> Accessed 3 May, 2010
- 
- Council of Ambulance Authorities.** *CAA Position Statement: Council of Ambulance Authorities views on the regulation of pre-hospital care providers.* Adelaide: Council of Ambulance Authorities Inc.; 2008.
- 
- Department of Health and Human Services.** *Planning Considerations for Health and Medical Services Response to Nuclear/Biological/Chemical Terrorism.* Washington DC, US 1996
- 
- Disasters Act**, 2008, NT [amended 2008 July 1]. Available from: <http://www.austlii.edu.au/>

**Disaster Management Act**, 2003, QLD [amended 2008 March 1]. Available from: <http://www.austlii.edu.au/>

**Emergencies Act**, 2004. ACT [Amended 2008, August 26]. Available from: <http://www.austlii.edu.au/>

**Emergency Management Act**, 2004. SA [Amended 2004, November 25]. Available from: <http://www.austlii.edu.au/>

**Emergency Management Act**, 2006. TAS [Amended 2006, September 20]. Available from: <http://www.austlii.edu.au/>

**Emergency Management Act**, 2005. WA [Amended 2007, February 1]. Available from: <http://www.austlii.edu.au/>

**Emergency Management Manual Victoria**, 2008. Offices of the Emergency Services Commissioner, Melbourne, Victoria. Available from: <http://www.oesc.vic.gov.au/wps/wcm/connect/OESC/>

**Entralgo P, Bloom S, Purtilo R.** Professional-Patient Relationship. In: Reich W (Ed) *Encyclopaedia of Bioethics*. New York: Simon and Schuster 1995

**Fire and Emergency Services Act**, 2005. SA [Amended 2008, April 17]. Available from: <http://www.austlii.edu.au/>

**Fire and Emergency Services Authority Act**, 1998. WA [Amended 2009, May 22]. Available from: <http://www.austlii.edu.au/>

**Health Services Act**, 1997. NSW [Amended 2009, May 13]. Available from: <http://www.austlii.edu.au/>

**Health Act**, 1958. VIC [Amended 2009, January 1]. Available from: <http://www.austlii.edu.au/>

**Health Act**, 1911. WA [Amended 2009, May 22]. Available from: <http://www.austlii.edu.au/>

**Health Act**, 1997. TAS [Amended 1997 June 19]. Available from: <http://www.austlii.edu.au/>

**Health Care Act**, 2008. SA [Amended 2008, July 1]. Available from: <http://www.austlii.edu.au/>

**Hooke WH (Ed).** *Public Health Risks of Disasters: Communication, Infrastructure and Preparedness: Workshop Summary*. The National Academy Press, Washington DC, 2001

**Huber SJ, Wynia MK.** When Pestilence Prevails...Physician Responsibilities in Epidemics. *The American Journal of Bioethics* 2004;4(1):W5-W11

**Human Rights Act**, 2004, ACT [amended 2009 February 2]. Available from: <http://www.austlii.edu.au/>

**Koh, D, Lim MK, Chia SE et al.** Risk perception and impact of SARS on work and personal lives of healthcare workers in Singapore – what care we learn? *Medical Care* 2005;43:676-682

**Maguire BJ, Dean S, Bissell RA et al.** Epidemic and bioterrorism preparation among emergency medical services systems. *Prehospital and Disaster Medicine* 2007;22(3):237-242

**Maunder R.** *The Experience of the 2003 SARS Outbreak as a Traumatic Stress among Frontline Healthcare Workers in Toronto: Lessons Learned*. *Phil Trans R Soc London* 2004;359:1117-1125

**McCann TV.** Willingness to provide care and treatment for patients with HIV/AIDS.

**Journal of Advanced Nursing**. 1997;25:1033-1039

**Metropolitan Ambulance Emergency Response Plan Overview**, 2007 [amended 2007 March]. *Ambulance Victoria*. Available from [www.ambulance.vic.gov.au/](http://www.ambulance.vic.gov.au/)

**National Health Act 1953**. 2009 [amended 2009 May 26]. Available from: <http://www.austlii.edu.au/>

**National Health Security Act**, 2007, Commonwealth of Australia [2007 September 28]. Available from: <http://www.comlaw.gov.au/>

**New South Wales State Disaster Plan (Displan)**, 2006, *Emergency Management*, NSW Government. Available from <http://www.emergency.nsw.gov.au/plans/displan> [accessed 2009 June 19].

**Notifiable Disease Act**, 1999, NT [amended 1999 April 7]. Available from: <http://www.austlii.edu.au/>

**NSW Healthplan**, 2008 (version 3.4), *NSW Health Counter Disaster Uni*, NSW Government. Available from: <http://www.emergency.nsw.gov.au/home.html> [accessed 2009 June 19].

**NSW Health Interim Influenza Pandemic Action Plan**, 2005, *Department of Health*, NSW Government. Available from: <http://www.health.nsw.gov.au/> [accessed 2009 February 4].

**O'Meara P.** Paramedics Marching Toward Professionalism (Guest Editorial). *Journal of Emergency Primary Health Care (JEPHC)* 2009;7(10):Article Number 990339

**Public Health Act**, 2005, QLD [amended 2008 July 1]. Available from: <http://www.austlii.edu.au/>

**Public Health Act**, 1997, ACT [amended 2009 February 14]. Available from: <http://www.austlii.edu.au/>

**Quarantine Act**, 1908, Commonwealth of Australia [Amended 2008 September 28]. Available from: <http://www.austlii.edu.au/>

**Queensland Health Disaster Plan**, 2008. *Queensland Health*, QLD Government. Available from: <http://www.health.qld.gov.au/emergtrans/> [accessed on 2009 June 18]

**Reilly B, Herp MV.** SARS and Carlos Urbani. *New England Journal of Medicine* 2003;348(20):1951-1952

**Ruderman C, Tracy CS, Bensimon CM et al.** On Pandemics and the Duty to Care: Whose Duty? Who Cares? *BMC Medical Ethics* 2006;7(5)

**Sepkowitz K.** *Occupationally Acquired Infections in Health Care Workers Part II*. *Annals of Internal Medicine* 1996;120(1):71-79

**Sheather R.** *Professionalisation.* In: O'Meara P, Gribich C, eds. *Paramedics in Australia: Contemporary challenges of practice.* First ed. Sydney: Pearson Education Australia; 2009:62-83.

**Silverman A, Simor A, Loufty MR.** *Toronto emergency medical services and SARS.*

**Emerging Infectious Diseases,** 2004;10(9):1688-1689

**Singer PA, Benatar Sr, Bernstein M et al.** *Ethics and SARS: Lessons from Toronto.* *BMJ* 2003;327:1342-1344

**State Emergency and Rescue Management Act,** 1989. NSW [amended 2007 January 3].

**State Emergency Services Act,** 1987. SA [Repealed by Sch 6 cl 13(c) of Fire and Emergency Services Act 2005 on 2005 October 1]. Available from <http://www.legislation.sa.gov.au/>

**State Health Emergency Response Plan (SHERP),** Health Displan Victoria, 2006, Department of Human Services, Melbourne Victoria. Available from: [http://www.dhs.vic.gov.au/emergency/health\\_displan](http://www.dhs.vic.gov.au/emergency/health_displan)

**State Service Act,** 2000, TAS [2000 December 20]. Available from: <http://www.austlii.edu.au/>

**Stein BD, Tanielian TL, Eisenman DP et al.** *Emotional and behavioural consequences of bioterrorism: Planning a public health response.* *Milbank Q* 2004;82(3):413-455

**Tasmanian Health Action Plan for Pandemic Influenza** (2008), Department of Premier and Cabinet, State Government of Tasmania, Hobart. Available from: <http://www.pandemic.tas.gov.au>

**Verbeek PR, McClelland IW, Silverman AC, Burgess RJ.** *Loss of paramedic availability in an urban emergency medical services system during a severe acute respiratory syndrome outbreak.* *Academic Emergency Medicine* 2004;11(9):973-97

**Victorian Ambulance Service Act,** 1986, VIC. [amended 2007 September 7]. Available from: <http://www.austlii.edu.au/>

**Victorian Emergency Management Act,** 1986, VIC. [amended 2008 May 1]. Available from: <http://www.austlii.edu.au/>

**Victorian Health Management Plan for Pandemic Influenza,** 2007. Department of Human Services, Melbourne, Victoria. Available from: [http://www.health.vic.gov.au/ideas/regulations/vic\\_influenza](http://www.health.vic.gov.au/ideas/regulations/vic_influenza)

**World Health Organisation.** *WHO Consensus Document on the Epidemiology of Severe Acute Respiratory Syndrome (SARS).* Geneva: WHO; October 17, 2003

## About the authors

**Dr Erin Smith** is a Senior Lecturer in the Department of Community Emergency Health and Paramedic Practice at Monash University and Course Coordinator for the Master of Emergency Health (Disaster Health and Emergency Preparedness Stream).

**Carly Woodd** and **Simon Jensen** are Paramedics with Ambulance Victoria.

**Frederick 'Skip' Burkle Jr** is a Professor at the Department of Community Emergency Health and Paramedic Practice at Monash University, and member of the Harvard Humanitarian Initiative, and Vice President of the World Association for Disaster and Emergency Medicine.

**Frank Archer** is a Professor, Head of the Department of Community Emergency Health and Paramedic Practice at Monash University, and Vice President of the World Association for Disaster and Emergency Medicine.





# Australian Emergency Management Institute

The Australian Emergency Management Institute (AEMI) is a centre of excellence for knowledge and skill development in the national emergency management sector. As part of the Attorney-General's Department, AEMI provides a range of education, training, professional development, information, research and community awareness services to the nation and our region.

AEMI is located at Mount Macedon in Victoria and was opened in 1956 as the Australian Civil Defence School. Since then, AEMI has had a significant role in building the capacity and professionalism of the emergency management sector in Australia.

AEMI continues to focus on improving knowledge and development in the emergency management sector. It supports broader national security capability development efforts to build community resilience to disaster.

Courses offered at AEMI include nationally accredited training courses and professional development programs. AEMI also hosts a range of workshops based on the national research and innovation agenda agreed by the National Emergency Management Committee.

A photograph of the Australian Emergency Management Institute (AEMI) entrance. A large sign in the foreground reads 'AUSTRALIAN EMERGENCY MANAGEMENT INSTITUTE'. The sign is set against a backdrop of large, mature trees and a building. The foreground is a paved area with a low stone wall.

AUSTRALIAN EMERGENCY  
MANAGEMENT INSTITUTE





Australian Government  
Attorney-General's Department  
National Security  
Capability Development Division

# NATIONAL SECURITY UPDATES

## NATIONAL SECURITY UPDATES

# National Security Capability Development News

**The following are extracts / summaries of news items and media releases that may be of interest to the emergency management sector.**

**10 DECEMBER 2009**

### **SECURITY COLLEGE REFLECTS ANU NATIONAL LEADERSHIP**

---

The announcement by Prime Minister Kevin Rudd that Australia's first National Security College will be established at The Australian National University was welcomed by ANU Vice-Chancellor Professor Ian Chubb.

Professor Chubb said the establishment of the College was a reflection of the role of the national university as a significant contributor to Australia's national interest.

"In August this year at the Annual Burgmann College Lecture, the Prime Minister announced plans for a new strategic relationship with ANU that would see a "re-invigorated" relationship between the Australian Government and ANU.

"The National Security College is the first element of that reinvigorated relationship, and harnesses the expertise of ANU as a strategic endowment for the nation.

"We look forward to delivering our end of that bargain" he said.

Professor Chubb said that the appointment of Rhodes Scholar and former Secretary of the Department of Foreign Affairs and Trade Michael L'Estrange AO as founding Executive Director would ensure the NSC had both the academic rigour expected of an ANU academic unit and the policy and public administration responsiveness expected by the Australian Government.

**23 DECEMBER 2009**

### **COMMONWEALTH AND NSW GOVERNMENTS AGREE ON DISASTER RESILIENCE PARTNERSHIP**

---

Commonwealth Attorney-General, Robert McClelland and New South Wales Minister for Emergency Services, Steve Whan, agreed on a \$15 million joint implementation plan for disaster resilience initiatives in New South Wales.

These measures will be provided under the Commonwealth's new \$110 million Natural Disaster Resilience Program (NDRP). The Program assists Government and non government agencies, in conjunction with the private sector, to cooperatively prepare for, and respond to, major natural disasters.

"The plan has been designed to maximise flexibility in targeting local priorities. It is the first to be signed between the Commonwealth and State and Territory Governments," Mr McClelland said.

Further information on the Natural Disaster Resilience Program can be found at [www.ema.gov.au](http://www.ema.gov.au)

## NATIONAL SECURITY UPDATES

**31 DECEMBER 2009**

### **COMMONWEALTH ASSISTANCE FOR WESTERN AUSTRALIAN BUSHFIRE VICTIMS**

---

After a visit to affected communities by the Parliamentary Secretary for Western Australia, The Hon Gary Gray MP, the Commonwealth Government has announced that it will provide financial assistance to communities affected by bushfires in Western Australia under the Natural Disaster Relief and Recovery Arrangements (NDRRA).

This assistance will apply to natural disaster declared areas, including Dandaragan, Coorow and Toodyay.

Funding will be provided in cooperation with the Western Australian Government.

Inquiries can be made to the Fire and Emergency Services Authority of Western Australia on (08) 9323 9552 or [wandrara@fesa.wa.gov.au](mailto:wandrara@fesa.wa.gov.au)

**8 JANUARY 2010**

### **COMMONWEALTH ASSISTANCE FOR FLOOD AFFECTED QUEENSLAND COMMUNITIES**

---

Attorney-General, Robert McClelland, announced the Commonwealth Government will provide financial support to the Queensland Government to assist with costs associated with helping communities in Central and South West Queensland impacted by recent heavy rain and flooding.

Commonwealth support is being provided to the Queensland Government through the Natural Disaster Relief and Recovery Arrangements. This assistance will reimburse the state of Queensland for a share of the costs associated with helping flood affected communities to rebuild damaged public infrastructure.

For more information visit [www.attorneygeneral.gov.au](http://www.attorneygeneral.gov.au)

**12 JANUARY 2010**

### **COMMONWEALTH ASSISTANCE FOR FLOOD AFFECTED COMMUNITIES IN THE NORTHERN TERRITORY**

---

Attorney-General, Robert McClelland and Federal Member for Lingiari, Warren Snowdon, announced that the Commonwealth Government will provide financial support to the Northern Territory Government to assist with costs associated with helping communities impacted by recent flooding.

Commonwealth support is being provided to the Northern Territory Government through the Natural Disaster Relief and Recovery Arrangements (NDRRA). This assistance will reimburse the Territory for a share of the costs associated with helping flood affected communities to rebuild damaged public infrastructure.

For more information visit [www.attorneygeneral.gov.au](http://www.attorneygeneral.gov.au)

## NATIONAL SECURITY UPDATES

### 28 JANUARY 2010

#### COMMONWEALTH ASSISTANCE FOR FLOOD AFFECTED QUEENSLAND COMMUNITIES

---

Attorney-General, Robert McClelland, announced that the Commonwealth Government will provide financial assistance to North Queensland communities impacted by recent heavy rain and flooding caused by ex-Tropical Cyclones Olga and Neville.

Funding will include assistance for the restoration of essential public infrastructure as well as costs associated with counter disaster operations.

Commonwealth assistance is being provided to the Queensland Government through the Natural Disaster Relief and Recovery Arrangements (NDRRA) and will be available in 14 affected local government area.

Residents requiring assistance with storm, flood and cyclone damage should contact the Queensland State Emergency Service (SES) on 132 500.

For more information visit [www.attorneygeneral.gov.au](http://www.attorneygeneral.gov.au)

### 07 FEBRUARY 2010

#### ANNIVERSARY OF BLACK SATURDAY BUSH FIRES

---

The Australian Government today joined with Victoria in marking the first anniversary of the devastating Black Saturday bushfires.

The Black Saturday bushfires were Australia's worst natural disaster since Federation, claiming 173 lives, devastating entire towns and communities, destroying more than 2,000 homes and leaving thousands of residents homeless.

February 7 will be forever etched in the nation's memory as a day of mourning but also one of tremendous spirit and inspiration.

The tragedy brought out the best of the Australian character and inspired countless acts of bravery and generosity.

Our thoughts today are with the survivors of the bushfires as they remember the people they lost and work to rebuild their lives and towns.

Their quiet courage has inspired a nation.

The Australian Government has worked closely with the local communities, the Victorian and local governments, business and non-government organisations to provide more than \$455 million to assist in the reconstruction and recovery of bushfire affected communities.

In August 2009, the Australian Government welcomed the interim report of the Victorian Bushfire Royal Commission and committed to implement all of the interim recommendations directed at the Commonwealth.

In cooperation with the States and Territories, the Australian Government has supported a range of measures to ensure that Australians are better prepared for bushfires.

This has included, for example, the provision of \$26 million for the development of a national telephone-based emergency warning system, 'Emergency Alert' and convening the inaugural bushfire pre-season briefing for emergency management officials.

Today's anniversary represents an important opportunity to reflect on this terrible tragedy and to acknowledge the critically important work of our emergency services and the generous support of the Australian community in helping those in need.

For more information visit [www.pm.gov.au/Media\\_Centre](http://www.pm.gov.au/Media_Centre)

## **09 FEBRUARY 2010**

### **TRIAL OF BUSHFIRE FIRE DETECTION CAMERAS**

---

Federal Attorney-General, Robert McClelland, Victorian Minister for Emergency Services, Bob Cameron, and New South Wales Minister for Forest Resources, Ian Macdonald, announced a comprehensive trial of bush fire detection cameras.

The trial will commence on 15 February in the Otway Ranges in Victoria and near Tumut in New South Wales and will run until the end of April, with a possible one month extension depending on prevailing conditions.

The cameras are able to continually monitor bushland and automatically detect smoke and lightning to enable the provision of exact information on where and when a fire starts. This will potentially assist fire fighters get to a fire in the shortest possible time in order to prevent it becoming an inferno.

The trial will be conducted in two parts, with locations chosen to provide broad area coverage and the opportunity for controlled testing where appropriate. Cameras for the trial will be provided by three private contractors: Firewatch, Eyefi and Forestwatch.

In Victoria, twelve cameras will be trialled at four locations covering the Otway Ranges at Mt Porndon, Crowes Lookout, Peters Hill and Mt Cowley under 'real conditions' without the use of controlled burning.

In New South Wales, three cameras will be trialled at Mt Tumorrana in the Tumut region under 'controlled conditions' which will include test burning to evaluate the performance of the system under simulated conditions.

The Australian Government will fund the trial, estimated to cost \$3 million, with coordination and facilitation provided by the Victorian and New South Wales Governments.

The Bushfire Cooperative Research Centre (CRC) will evaluate the trial by comparing the effectiveness of different camera systems and examining their ability to accurately detect fires, avoid false detections, and their potential to be integrated into existing emergency management processes, including for example, providing timely warnings to the community.

This analysis will enable the technology to be evaluated against other existing bush fire detection systems including fire spotters in towers or planes, public reports through the triple-zero emergency service, or through satellite systems.

This trial demonstrates the strong commitment of Commonwealth and State Governments to pursue all possible avenues to better protect Australian communities from bushfire.

For more information visit [www.attorneygeneral.gov.au](http://www.attorneygeneral.gov.au)

## **17 FEBRUARY 2010**

### **COMMONWEALTH ASSISTANCE FOR NEW SOUTH WALES FLOOD AFFECTED COMMUNITIES**

---

Attorney-General, Robert McClelland, today announced that the Commonwealth Government will provide financial assistance to New South Wales communities affected by recent flooding in the south coast and far west.

Commonwealth assistance is being provided to the New South Wales Government through the Natural Disaster Relief and Recovery Arrangements (NDRRA) and will apply to disaster declared areas on the south coast including Bega and Eurobodalla Shires as well as Central Darling and Cobar Shires in the far west.

For more information visit [www.attorneygeneral.gov.au](http://www.attorneygeneral.gov.au)

## NATIONAL SECURITY UPDATES

### **19 FEBRUARY 2010**

#### **COMMONWEALTH AND VICTORIA AGREE ON DISASTER RESILIENCE PARTNERSHIP**

---

Federal Attorney-General, Robert McClelland and Victorian Minister for Emergency Services, Bob Cameron, today announced a \$7.8 million joint implementation plan for disaster resilience initiatives in Victoria.

The plan formally implements the National Partnership Agreement on Natural Disaster Resilience signed by the Prime Minister and the Victorian Premier at the Council of Australian Governments (COAG) meeting in December 2009.

The implementation plan will be funded under the Commonwealth's new \$110 million Natural Disaster Resilience Program (NDRP) which assists Government and non government agencies, in conjunction with the private sector, to cooperatively prepare for, and respond to, major natural disasters.

Further information on the Natural Disaster Resilience Program can be found at [www.ema.gov.au](http://www.ema.gov.au)

### **03 MARCH 2010**

#### **COMMONWEALTH ASSISTANCE FOR QUEENSLAND FLOOD AFFECTED COMMUNITIES**

---

Attorney-General, Robert McClelland, announced that the Commonwealth Government will provide financial assistance to Queensland communities affected by recent flooding.

Commonwealth assistance is being provided to Queensland through the Natural Disaster Relief and Recovery Arrangements (NDRRA) and will apply to disaster declared areas in 56 Local Government Areas throughout the State.

Funding will include assistance for the restoration of essential public infrastructure as well as costs associated with counter disaster operations.

The Commonwealth, through Emergency Management Australia, will continue to work closely with Queensland authorities, local government and community organisations to ensure that affected communities have all the support they need during this difficult period.

For more information visit [www.attorneygeneral.gov.au](http://www.attorneygeneral.gov.au)

## 06 MARCH 2010

### **Tsunami Awareness Project**

---

Attorney-General, Robert McClelland, and Surf Life Saving Australia (SLSA) Director of Life Saving, Peter George, promoted an innovative awareness program at Bondi Beach to help the general public and surf life savers better prepare and respond to tsunami warnings.

“The earthquake in Chile last weekend and the subsequent issue of tsunami warnings for the east coast of Australia demonstrated that while the tsunami warning system worked well, sections of the public chose to ignore the warnings,” Mr McClelland said.

The awareness program, prepared in conjunction with the States and Territories, includes a new interactive online resource to assist life savers and other beach management personnel deal with the general public in the event of a tsunami warning.

Education materials will also be provided for school kids and recreational boaters, fishers and other marine users about the nature of tsunamis, what to look out for and basic actions that should be taken in the event of a warning, including:

- not travelling to the coast or headlands to watch the tsunami;
- the importance of moving inland or to higher ground;
- returning and securing boats that are in shallow water; and
- moving vessels already at sea to deep water, well offshore.

Since the devastating Boxing Day tsunami in 2004, Australia has made significant advances in the coordination of responses to advise and alert the public of tsunami warnings.

Tsunami warnings are provided through the Australian Tsunami Warning System (ATWS), which is jointly operated by the Bureau of Meteorology and Geoscience Australia, and is provided through the Joint Australian Tsunami Warning Centre (JATWC) which operates 24-hours a day, seven days a week to detect and verify tsunami threats to Australia.

The centre uses sea surface buoys and undersea sensors to measure earthquake activity and the likelihood of a tsunami affecting Australia. In the event of a tsunami threat to Australia, warnings are issued through the media, including local radio and television announcements as well as messages through emergency service workers, lifeguards and surf life savers.

A CD Rom of the awareness program has been distributed to all Australian Surf Life Saving Clubs and is also available at [www.beachsafe.org.au/tsunami](http://www.beachsafe.org.au/tsunami)

## 10 MARCH 2010

### **Emergency Management Cooperation with New Caledonia**

---

Australia and French New Caledonia have agreed to strengthen their cooperation in preventing and responding to bushfires and other natural disasters, under a Letter of Intent signed by the Attorney-General, Robert McClelland.

The Letter of Intent calls for Australia and New Caledonia to:

- share information about preparations for natural disasters and emergencies, including disaster response plans;
- share information on each Government’s emergency management frameworks;
- undertake professional development of emergency managers, including exchanging ‘lessons learned’ experiences from recent natural disasters; and
- build networks between Australian and New Caledonian emergency management agencies including through the exchange of technical experts and specialists.

The Letter of Intent also calls for emergency management authorities in both countries to establish arrangements for the exchange of personnel in response to emergencies.

For more information visit [www.attorneygeneral.gov.au](http://www.attorneygeneral.gov.au)



<b>Australian Police Medal</b>
<b>Australian Federal Police</b>
DARE, Superintendent Marzio
MORRIS, Assistant Commissioner Timothy
<b>New South Wales</b>
BURNS, Detective Sergeant, John Michael Thomas
CLARKE, Detective Inspector, Dennis John
GALLAGHER, Sergeant David William
LOCKREY, Sergeant Stewart Andrew
McERLAIN, Detective Superintendent Peter Gerard
McNAB, Detective Inspector Ian Eric
O'REILLY, Inspector Philip Thomas
WAITES, Superintendent Susan Elizabeth
<b>Victoria</b>
BUTERA, Senior Sergeant Vincenzo
CORNELIUS, Assistant Commissioner TD Luke

GLEESON, Superintendent Stephen Craig
HOUGH, Inspector Gregory Stuart
O'NEILL, Superintendent Christopher Andrew
WATSON, Inspector Dennis Leslie
<b>Queensland</b>
BENFER, Sergeant Gregory Neville
BOND, Superintendent Rowan Thomas
DAWSON, Superintendent Alistair Ewen
GOLLSCHEWSKI, Chief Superintendent Stephan William
KEOUGH, Superintendent James
POND, Senior Sergeant Charysse Adele
<b>Western Australia</b>
BUDGE, Superintendent Gary John
CASTLEHOW, Detective Superintendent Graeme Maxwell
GREEN, Superintendent Hadyn Reginald

<b>South Australia</b>
BROWN, Senior Sergeant Cheryl Marie
MALKIN, Rodney Ian
SMITH, Assistant Commissioner Neil Severn
<b>Tasmania</b>
McMAHON, Sergeant Patrick George
TIMMINS, Senior Constable Stephen Charles SC
<b>Northern Territory</b>
SCHULTZ, Detective Sergeant Wendy
TAYKOR, Sergeant Shane Michael

<b>Australian Fire Services Medal</b>
<b>New South Wales</b>
BAKER, Marcus Gilbert, Lilli Pilli
BALDO, Angelo John, Glenorie
DOWLING, Colin Edward, Dubbo
GREEN, Gregory John, Bargo
HAWKINS, Robert John, Narromine

HOWLEY, Lance Edward Kyalite
PARISH, Richard James, Bringelly
PEARCE, Steven Jon, Helensburgh
ROBERTS, Neville David, Narromine
SMITH, Ian Alexander, Yerrinbool
<b>Victoria</b>
ALLEN, David Robert, Monegeetta
CUSACK, Andrew John, Mumbannar
DE LA HAYE, Phillip John, Hastings
EDWARDS, Roger Eric, Cavendish
O'MALLEY, Stephen Patrick, Eltham
SMITH, Robert Matthew, Ocean Grove
STUART, Maxwell Albert, Denison
ZAMMIT, Andrew John, Coburg
<b>Queensland</b>
ALEXANDER, Alister Donald, Barcaldine



# Australia Day HONOURS LIST

**Western Australia**

FOUREUR, Stephen Roy, Iluka

JACKSON, Terence Howard, Woodlands

JOHNSTON, Donald Sydney, Wellard

MESSINA, Antonio John, Mullewa

MESSINA, Charles Carmelo, Mullewa

**South Australia**

PEARCE, David Thomas

SCHMERL, David Arthur, Scott Creek

SEPPELT, Gerold, Nuriootpa

**Tasmania**

BENNELL, Graham Ronald, Forth

COMER, Andrew Charles, West Launceston

TYRRELL, John Cambridge

**Ambulance Services Medal**

**New South Wales**

BEAVAN, Denis Alan, Batemans Bay

GOOD, Phillip James, Thornleigh

HESCOTT, Jeffrey William, Cameron Park

SINCLAIR, Garry Kenneth, Kenthurst

STEWART, Paul William, Soldiers Point

VERNON, James Edwin, Jewells

**Victoria**

BARGER, William James, Oak Park

CAMERON, Michael William, Barwon Heads

DUNELL, Victoria lee, Pheasant Creek

GEER, Jennifer Elizabeth, Devenish

SULLIVAN, Tanya Elizabeth, Nagambie

**Queensland**

CAHILL, Peter John, Cairns

CLARKE, Lucinda, Toowong

GILLIES, Gary Gordon, Minyama

**Western Australia**

CALLAGHAN, Desmond Louis, Leederville

GRAY, Paul Markus, Gidgegannup

GRIST, Jill, Kudardup

**South Australia**

KIMBER, Martin Paul, Bellevue Heights

VAUGHAN, Anthony Ross, Tanunda

**Tasmania**

KNOWLES, Brian Wayne, Wayatinah

McNAMARA, Catherine Sarah, West Hobart

WILSON, Cheryl Irene, Midway Point

**Emergency Services Medal**

**New South Wales**

CAMPTON, Peter James, Banora Point

GORDON, Dianne Ruth, Coniston

HILL, Kevin Michael, Vincentia

LALOR, Peter Ronal, Wilberforce

SLATER, Gregory Robert (dec) Mount Keira

TYACKE, Jean Elizabeth, Cammeray

**Victoria**

ALLAN, Andrew John, Rye

BOYD, John Richard, Wodonga

DODS, Mark Thomas, McCrae

**Queensland**

PAGANO, Frank Mark, Bald Hills

**South Australia**

UNDERWOOD, Brian Raymond, Coober Pedy

**Tasmania**

BIRD, Philip Leon, Devonport

STREET, Michael Hansen, West Hobart

**ACT**

McENROE, Doreen Joan, Kaleen

**Northern Territory**

KILLMISTER, Joanne, Maningrida Community

# IN PROFILE:

## Frank Pagano AFSM ESM

**Frank Pagano is the Executive Director for Emergency Management Queensland (EMQ) and the State Emergency Service.**



Emergency Management Queensland (EMQ) is a diverse operational division within the Department of Community Safety (DCS) which is responsible for:

### **Effective disaster management**

- Leading, coordinating and reviewing performance, planning and exercising for those activities necessary before, during and after a disaster or major, multi-response emergency;
- The provision of disaster management training, community based disaster awareness and mitigation services;
- Coordination of the state disaster management system and state disaster response management; and
- Disaster mitigation and administration of Natural Disaster Relief and Recovery Arrangements (NDRRA).

### **Volunteers**

- The management of the State Emergency Service (SES), Emergency Service Units (ESU) and Emergency Services Cadets; and
- Support and funding assistance for Volunteer Marine Rescue organisations (ie Volunteer Marine Rescue Association of Queensland; Australian Volunteer Coast Guard Association; Surf Life Saving Queensland; and the Royal Life Saving Society Australia) and lifesaving activities.

### **Provision of helicopter rescue**

- Provision of the State Government helicopter rescue and aeromedical services (EMQ Helicopter Rescue) and management of contractual arrangements with helicopter contractors and community helicopter providers.

Frank is the Executive Officer to the State's peak disaster management body, (the State Disaster Management Group) and is tasked with the ensuring the effectiveness of the disaster management system and also holds, on behalf of the State, the Air Operators Certificate (AOC) for the State Government's helicopter fleet and is therefore responsible for the operations of the three EMQ helicopter rescue bases in Cairns, Townsville & Brisbane which involves a fleet of five helicopters.

Frank has been in the Emergency Services field for 34 years. Prior to being appointed the Executive Director for EMQ, he was the Deputy Commissioner for Queensland Fire & Rescue Service.

Frank has had played a leading role in every Queensland natural disaster since Cyclone Larry in 2006. Frank spent three months working in Innisfail leading the operational recovery management group, which supported the work of Major General Peter Cosgrove following the impact of Cyclone Larry in 2006. In February 2009, Frank was appointed as Coordinator-General for the North West Floods and worked in Normanton and Karumba to enhance co-ordination of the region's re-supply and planning for recovery.

# Case study: Exercise “Stuffed Goose” – involving Culturally and Linguistically Diverse (CALD) communities.

In March 2007, representatives from the Migrant Resource Centre SA, Multicultural SA, Metropolitan Fire Service SA and the Department for Families and Communities SA attended a national workshop at the Australian Emergency Management Institute with the aim of developing a project to undertake a series of “consultation and engagement activities between CALD communities and the emergency management sector” within South Australia<sup>1</sup>.

This project is one of the Jurisdictional Community Partnership projects being undertaken nationally as part of the Attorney-General’s Department’s *Inclusive*

*Emergency Management with CALD Communities Program.*

The opportunity to include members of a CALD community in an emergency management training exercise planned for November 2007 was identified and supported by the project team.

Exercise “Stuffed Goose”<sup>2</sup> was to be a significant, multi-agency exercise involving State Government departments and agencies, including the Country Fire Service (CFS), SA Police, State Emergency Service (SES), Metropolitan Fire Service SA, Local Government, and community volunteers. It was coordinated by Primary Industries and Resources South Australia (PIRSA) and involved a simulation of a major bushfire that threatened the township of Murray Bridge, surrounding farms, parks, and significant transport, electricity and water infrastructure.

The Migrant Resource Centre of South Australia (MRCSA) is an independent, non-government peak settlement agency responsible for the settlement



At the mock emergency recovery centre (Source: Murray Valley Standard, 2007).

and participation of migrants and refugee entrants across all of South Australia and operates from various metropolitan and rural locations. As Murraylands is one of the regional areas serviced by The Migrant Resource Centre of SA (MRCSA), and includes the township of Murray Bridge, it was suggested that the Murraylands Multicultural Network (MMN) be the appropriate body to advise on community involvement in the exercise.

Following a meeting with the MMN and a briefing held at the Murray Bridge TAFE, six women from the local Filipino community volunteered to participate in the exercise in the following areas:

- As observers at the Zone Emergency Centre
- As a volunteer 'disaster affected person' or a 'meeter and greeter' (a role usually undertaken by the Australian Red Cross) within the Recovery Centre.

### Summary of feedback from CALD community participants

At the completion of the PIRSA exercise, the volunteers were given a one-page feedback form to complete.

Following is a summary of the comments from those feedback sheets.

- Increased knowledge of fire safety and managing emergencies.
- Learning about emergency service organisations and particularly the need for communication between the agencies.
- A feeling of confidence in attending a Zone Emergency Centre and Recovery Centre.
- Enjoyed participating in the Recovery Centre activity.
- Confidence in ability to take on a role of informing their local CALD community about recovery centres, and what will be available there. Also a willingness to assist in the 'meet and greet' element of a recovery centre.

### Exercise debrief for CALD community participants

A debrief was held on 27 March 2008 and was attended by four of the CALD participants. They were invited to share their thoughts on the exercise with the group.

Key Points and Suggestions from the Exercise Stuffed Goose Debrief:

- Having access to interpreters for identified nationalities within communities is critical to the success of managing an emergency safely and inclusively.
- Women (who are housebound) and workers isolated from the community (such as 457 Visa holders) are most likely to have low or non-existent English skills and are therefore more at risk in an emergency situation.
- Emergency Service Organisations should be notified where there are significant CALD communities identified and a CALD Register created with up-to-date contact lists, agencies, useful networks,

support groups and individuals who can assist in an emergency situation.

- Picture cards (or Crisis Communication Cards) showing emergency pictures and actions accompanied by translation in various languages would be useful for emergency workers, and standard equipment on all Emergency Service vehicles.
- Local support groups could be formed from interested residents from a variety of ethnic backgrounds who could be trained to appropriately facilitate emergency management within their communities.
- The need to find a way to communicate with all members of non-English speaking communities, and educate them about emergency management.

Source: SA Inclusive Emergency Management with CALD Communities Report 2007

### Recommendations:

The following recommendations were compiled as a result of this project to be forwarded to relevant State committees:

- The involvement of CALD communities is considered in the planning for all future exercises and that participation in a range of activities is promoted.
- To enhance the involvement/observation at a Zone Emergency Centre, develop a list of questions or issues that the participants can use to enhance their learning experience.
- Review emergency management arrangements and ensure that culturally sensitive approaches are in place.
- Investigate how the CALD community can take on a role in a Recovery Centre following an event.

Source: SA Inclusive Emergency Management with CALD Communities Report 2007

Reinforcing the benefit of CALD community involvement in exercises such as this one, one of the participants said she believed it was good for her community to know what to do, who to call, and where to go.

"Every person needs to know the first thing to do," she said. "If you know the first thing; you can find the second thing ..."

### (Endnotes)

<sup>1</sup>SA Inclusive Emergency Management with CALD Communities Report 2007.

<sup>2</sup>The 'Goose' is the mascot of retiring PIRSA staff member, Garry MacPhie, who coordinated the 31 Goose exercises.

COMING UP IN MAY AT AEMI, MT MACEDON, VICTORIA

# PARTICIPATION, PARTNERSHIPS, RESPECT AND RESILIENCE

## EMERGENCY MANAGEMENT IN A MULTICULTURAL SOCIETY



AUSTRALIAN  
multicultural  
foundation

In collaboration with the Australian Multicultural Foundation, the Attorney-General's Department is hosting a Forum on May 21st 2010, to identify key strategies to support the continued strengthening of community disaster resilience. A highlight of the Forum will be the launch of a publication with presentations of evidence-based achievements from successful community engagement initiatives that have resulted from the *Inclusive Emergency Management with Culturally and Linguistically Diverse (CALD) Communities* program.

Recognising that the four central concepts in emergency management—Prevention, Preparedness, Response and Recovery (PPRR) each have a social component, this Forum offers the parallels of Participation, Partnerships, Respect and Resilience as its core premise.

In line with the Australian Government's National Compact with the Third Sector a national partnership between the Attorney-General's Department, the multicultural sector and the emergency management sector will be initiated. This partnership will be launched at the Forum.

Participants will be invited to attend. A report outlining the outcomes of the Forum will be developed.

### FORUM AIM

To advance national action on strengthening disaster resilience for all Australians

### FORUM OBJECTIVES

1. To launch the publication *Partnerships, Participation, Respect and Resilience - National examples of emergency management in a multicultural society* showcasing successful state and territory community partnership projects
2. To highlight the achievements, the four-year program, *Inclusive Emergency Management with Culturally and Linguistically Diverse Communities*
3. To launch a national partnership, representative of the Attorney-General's Department, multicultural and emergency management sectors, that will continue to advocate for and support disaster resilience in our multicultural society
4. To seek participant input into future directions for building disaster resilience in a multicultural society
5. To enlist membership of a national web-based network that will allow for on-going information exchange and collaborative learning between all states and territories

# INTERESTING WEBSITES:



## WORLD CONFERENCE ON DISASTER MANAGEMENT

TORONTO, CANADA JUNE 6-9, 2010

[www.wcdm.org](http://www.wcdm.org)

### Building Solutions for a Global Community Emergency Management and Business Continuity Working Together

The World Conference on Disaster Management (WCDM) offers a unique experience, bringing together experts, practitioners, certifying bodies, service and product suppliers from Emergency Management, Business Continuity and other Disaster Management disciplines.

- The Conference offers new ideas and approaches that will help you:
- Build Solutions for a Global Community
- Gain a global perspective with the best selection of international speakers
- Receive professional training for all levels of disaster management through classified workshops, concurrent and keynote sessions

The WCDM recognizes that showcasing the best in industry-related products and services; providing focused education and training; networking with peers worldwide, will help reach its goal of ensuring prepared and resilient small businesses, corporations and communities.

Please review the information on their website and help celebrate 20 years of progress.



## INTERNATIONAL TSUNAMI INFORMATION CENTRE (ITIC)

<http://ioc3.unesco.org/itic/contents.php?id=664>

This site is authored by UNESCO to provide information about Tsunamis for anyone wanting to further their knowledge about the phenomenon.

It contains general awareness materials and information about Tsunamis as well as technical information about what Tsunamis are, when they become dangerous and what to do about them.

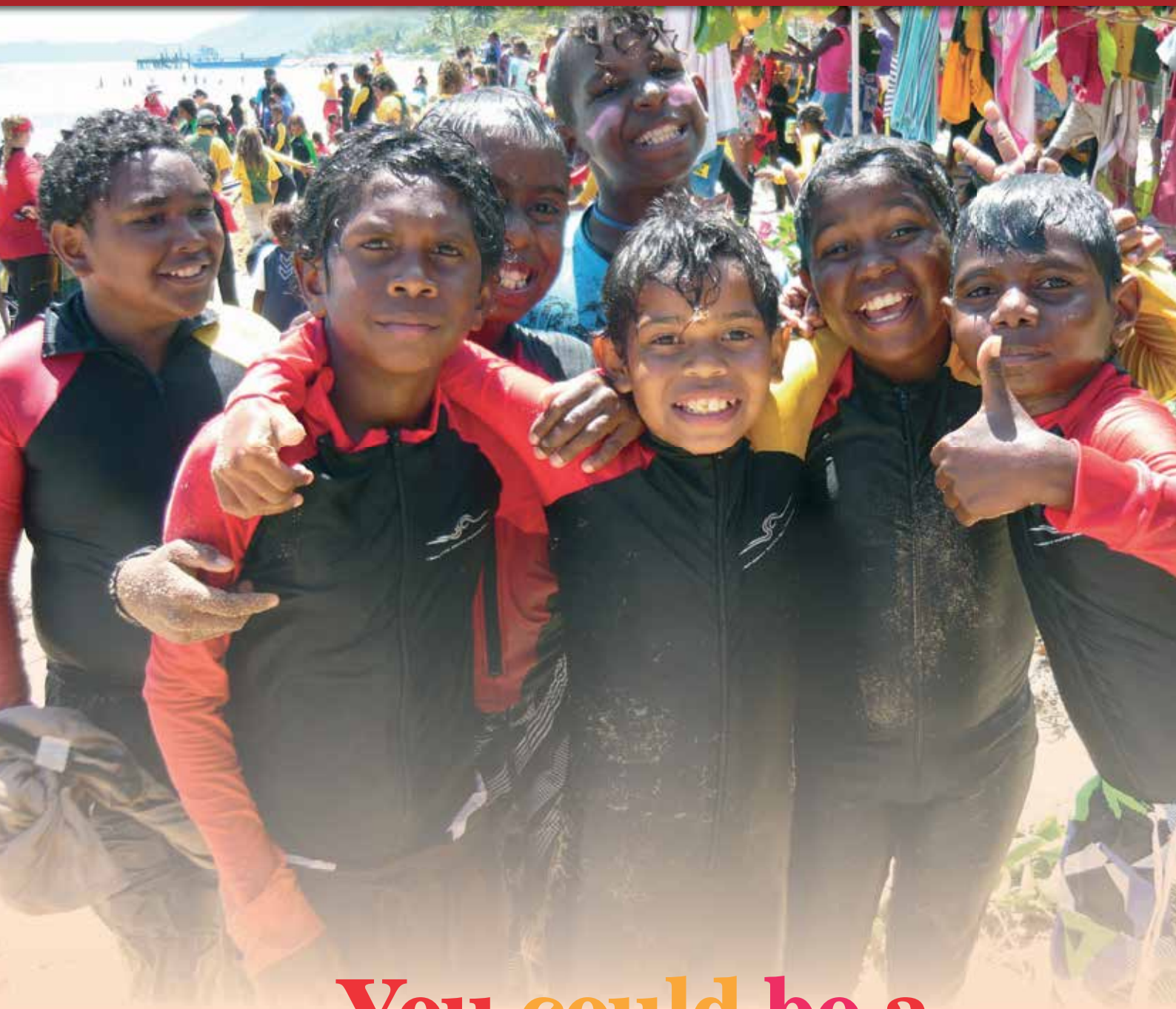
The site also recommends other information sources about Tsunamis and the programs and intergovernmental programmes that assist with preparedness for Tsunami events.



by education training research  
emergency management community safety  
ing research response & recovery  
nt community safety education tra



Australian Government  
Attorney-General's Department



# You could be a 2010 Australian Safer Communities Award winner



To find out more, visit [www.ema.gov.au](http://www.ema.gov.au)  
Entries close 2 July 2010