



# The Australian Journal of **Emergency Management**












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*Cover: Emergency exercises and training are essential to the development of an emergency plan.*

The  
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The journal endeavours to provide an information sharing forum for all those involved in emergency management. Contributions relating to Australian and international emergency activities, articles identifying and discussing issues, policies, planning or procedural concerns, research reports and any other information relevant to the emergency and disaster management community are welcome.

The aim of this publication is the exchange of information and views across the Australian emergency management community, therefore, the views expressed in this journal should not be taken to be the views of Emergency Management Australia.

This journal incorporates a review process. Three levels of review—refereeing, editorial board review and editing—are conducted. Material submitted for publication should be on disk and reach the Editor by the following dates: Summer—September 15th; Autumn—December 15th; Winter—March 15th; Spring—June 15th. The editorial committee reserves the right to determine the suitability of all material submitted and where necessary to edit submissions.

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# Education and training for the emergency management profession

In September 1998 Emergency Management Australia (EMA) commissioned a report *The Role of the Australian Emergency Management Institute (AEMI) in Development and Delivery of Emergency Management Education and Training Post 2000*. One of the major recommendations of the Report was that AEMI (the education and training arm of EMA) should 'provide a leadership role for the professionalisation of the broad emergency management community'.

The Oxford Dictionary defines a professional as one who '...is skilled in the theoretic or scientific parts of a trade; who raises his trade to the dignity of a learned profession'. Webster's Dictionary describes a profession as 'a vocation requiring specialised training in a field of learning, art or science'.

The professionalisation urged by the Report, then, obviously referred to a perceived need for emergency managers to be exposed to further opportunities to increase their learning and training in their vocations.

This edition of the Australian Journal of Emergency Management contains some articles addressing this issue. The Spring edition will continue this theme.

In this issue, David Crew's article considers the perception of emergency management as a discrete profession, particularly in the US context, in light of the significant effort and resources that have been invested by FEMA in proliferating graduate and undergraduate EM education programs throughout the tertiary institutions of the USA.

Closer to home, Ian Manoch's article surveys the range of tertiary emergency management education in Australia. It drives home, in dramatic fashion, the fact that there has been a significant increase in the past few years in the number of organisations and agencies prepared to provide education and training for emergency managers. In 2000, AEMI conducted a Workshop for all Australian TAFE and University institutions which offer emergency management education and training. The resultant exchange of

information has resulted in a series of partnerships and networks which have strengthened the range of options available to emergency managers who seek to improve their professional standing.

Emergency management education and training is offered at various levels by a broad range of institutions in Australia, which bodes well for the resilience of the national emergency management sector. Emergency managers requiring operator level training receive it from State and Territory Emergency Service training institutions and TAFE colleges. Management level training is carried out by some of these organisations, together with AEMI. Higher level Professional Development programs are provided by a range of bodies including AEMI, while specific industry-based training for all levels is conducted by commercial industrial companies. Graduate Diplomas, Bachelor and Masters Degrees are offered by an increasing number of tertiary institutions. Specialist emergency management modules and units are also offered by a number of establishments in other degree programs (eg nursing, engineering).

The recent launch of the Public Safety Training Package means that emergency management competencies are now enshrined in the Australian Qualifications Framework. Articulation of competencies and qualifications achieved through training under this process into higher level qualifications is a strategy being diligently pursued by AEMI and other training and education bodies. Work has begun to consider the identification of other competencies in the

sector which will help inform and create other recognised training regimes for the profession.

The emergency management sector is embracing concepts such as Community Safety and Resilience and Emergency Risk Management. This, together with an increasing recognition of our part in a whole-of-Government approach to emergencies, means emergency managers (noting that emergency managers can be found in a whole range of professions, not just the traditional emergency services) must be given the opportunity to maintain their professionalism by adopting and applying the different range of skills demanded of them. AEMI, the State and Territory training bodies and the TAFEs and universities are responding to these requirements represented by our industry clients. In particular, a move towards the 'softer' sciences, an emphasis on skills that contribute to successful dealings with community-related issues are all receiving significant attention. Rather than competing with each other, the various education and training institutions are working in partnership to maximise the opportunities available to emergency managers to maintain the professionalism for which Australian emergency managers are recognised nationally and internationally.

**Mr Dudley McArdle**  
Director  
*The Australian Emergency Management Institute*

# The case for emergency management as a profession

## Introduction

Emergency management is a relatively new profession that has evolved from emergency services and civil defence backgrounds. Because it is relatively new, it has suffered from many growth and identity problems.

## Background

In the 1970's, there was a growing awareness in the United States, that large and catastrophic disasters required extraordinary response at all levels of Federal, State and Local government. Costs of disasters in the US were soaring for governments and there was a need to create a Public Law in order to provide for Federal mitigation, readiness, response and recovery structures, with resource application, in a cost-benefit manner that met the needs of citizens and the economy.

Growing populations and higher concentrations of economic resources in specific geographical areas are being adversely affected by natural and man-made disasters and these are having greater impact on 'Quality of Life' issues in the US.

The Federal Emergency Management Agency (US) was established by the US Congress in 1979. Following that, in 1988, the Federal Government passed *The Robert T. Stafford Disaster Relief and Emergency Assistance Act*, (hereafter referred to as the Stafford Act) of 1988, which replaced the Civil Defense Act of 1950.

The Stafford Act provides for an 'All-Hazard Authority' in dealing with risks and tasks involved in disaster activities. To administer emergency management programs under the Stafford Act, the Federal, State and Local governments began training individuals to perform emergency management functions in all levels of Government and in non-Government Organisations (NGOs).

## Standards

As emergency management systems are maturing, standards are being adopted by both the public and private sectors. Most standards are based on an integrated 'All Hazard' emergency management programs. Standards are measures of

by David T. Crews CEM,  
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performance and readiness for emergency management.

Because standards are being adopted, emergency managers must be able to incorporate comprehensive policies and procedures based on these standards into their management plans and programs. This requires both training and application of leadership and management skills.

The National Fire Protection Association (USA) has published the *NFPA 1600 Standard on Disaster/Emergency Management and Business Continuity Programs*. The *NFPA 1600* will require those engaged in the Emergency Management career field to perform at a higher professional level.

## Discussion

With the creation of the Federal Emergency Management Agency in the United States, the profession of emergency management came into it's own. Emergency management differs from the Emergency Services (ES), sometimes referred to as 'first response' disciplines, which are familiar to most people. First response disciplines are usually linked to personnel in fire, police, Emergency Medical Services, and public works (civil engineers) services. From the beginning, emergency management as a profession has been misunderstood as a distinct and separate career field from other ES professions.

What distinguishes emergency management from the other more traditional ES disciplines is in the nature and character of it's activities and roles in disaster readiness and response. First response can be considered more tactical in the application of management principles, while emergency management is more strategic and long range. First response generally operates in an emergency environment that is smaller in

scope (small geographical area, fewer people and economic resources affected). Both emergency management and first response are valuable community resources.

For an 'all hazards' approach as outlined in the Stafford Act, emergency management is 'longer in range' and must cross more of the traditional political, bureaucratic and administrative boundaries (sometimes called 'partnering') in order to lessen the impacts of a major disaster on a geographical area. At the Federal level, this 'partnering' has been formalised in the Federal Response Plan. Mitigation and preparation are the main focus for emergency management.

Conversely, response and recovery are the main focus of first response, and both operate together strategically and tactically as conditions dictate.

Because recovery is usually a long-term activity, emergency management is also heavily engaged in programs for business recovery, individual and public assistance (Government to Government) programs.

## Conclusions

In their primary and 'strategic' roles, emergency managers must analyse the threat to economic and population centers; determine the significance of that threat, gauge the potential scope of the threat (size and impact); project threat frequency and provide a course of action (Emergency Operations Plan) for governing bodies.

They must also identify, satisfy and coordinate requirements that are identified in risk (threat) analysis through application of assets in geographically administered areas by integrating and using academic, business and industry, Government, and volunteer resources. Emergency managers also are required to tactically respond in support of the Emergency Operations Plan when circumstances dictate. They are often in charge of Emergency Operations Centers (EOCs) with critical information and communications resources during large disasters and catastrophes.

Money and fiscal policy are required for viable emergency management programs in order to man, equip, train, and

maintain a 'state of readiness.' Motivation to mitigate and reduce or negate disaster impacts will determine the level of readiness of a geographical area. It takes a certain amount of fiscal resource to perform this strategic function.

Governing bodies are an integral part of emergency management programs because they are the legal bodies that set policy, enact legislation and have legal authority over how public and private monies are acquired, used and disposed of.

Emergency managers must work with governing bodies to create public policy, strategically plan, and reduce or eliminate duplication of effort or misapplication of resources.

Coordination and strategic planning between resource owners to satisfy disaster requirements is a key responsibility of the emergency manager. This management effort will produce some of the best cost-benefit outcomes possible in the saving of lives and protection of property.

### Recommendation

Anyone engaged in emergency management should continue with self-improvement, education, and training opportunities. Emergency management requires an individual with a breadth and depth of professional experience in academia, government, business, or a volunteer organisation specialising in emergency or disaster activities.

A four-year college degree or equivalent with a major in Emergency Management, Public and/or Business Administration, Political Science, or Urban Planning is helpful. An advanced College Degree in these majors would be better.

Leadership and management skills coupled with technical competency in communications, information systems, and public speaking is a must. Having achieved that level of professional competence, peer recognition via certification is highly desirable!

### References

Crews D., 1999, 'Why Emergency Management as a Profession?', *American Society of Professional Emergency Planners (ASPEP) Journal*, pp. 23-25.

NFPA 1600 *Standard on Disaster/Emergency Management and Business Continuity Programs 2000 Edition*, NFPA International, 1 Battery Park, Quincy, MA. February 2000.

Student Manual (SM 230), 1990, *Introduction to Emergency Management*, FEMA Emergency Management Institute, July. pp. II-18 to II-II-25.

### Notes

1. Crews, David T., This article is adapted from previous articles in *the American Society of Professional Emergency Planners (ASPEP)* and an electronic article posted on the *Emergency Management Gold!* by David Crews:

[www.disasters.org/emgold](http://www.disasters.org/emgold)

2. Copies of the *Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288 as Amended, 42 U.S.C. 5121 et seq, The Federal Response Plan (FRP), as amended*, and the *FEMA State and Local Planning Guide (SLG 101)* can be obtained in hard copy free of charge from the FEMA Distribution Center, 8231 Stayton Drive, Jessup, Maryland 20794 or by calling 1-800-480-2520.

**"The primary activities of Emergency Management and First Response differ, and they both require personnel who are competent, highly skilled, trained, and experienced in their own specific professional areas."**

3. The International Association of Emergency Managers offers a Certified Emergency Management (CEM) program. The website is at: [www.iaem.com](http://www.iaem.com). There are other professional disaster and Emergency Management Associations as well.

### About the Author

David T. Crews, CEM currently works in Information and Planning, Emergency Support Function 5 (ESF-5) for FEMA Region 7, as a Disaster Assistance Employee (DAE), in Information and Planning.

He has been deployed to over 10 disasters in the past four years: California (1), Colorado (1), Georgia (1), Kansas (2), Iowa (3), Nebraska (2), Nevada (1) and Missouri (1). His background experience includes Major Command Staff Duty with the United States Air Force (USAF) in

electronics, inspection (IG), maintenance, training, photo mapping and plans. Served as a Director on the Logistics Dais in NORAD (North American Air Defense Command), Cheyenne Mountain Complex and Headquarters Staff with the responsibility for Strategic Planning the recovery and reconstitution of the North American Continent.

Served as the Mayor of Clearwater, Kansas for three years and as a Director of Emergency Management in local county government for two years. He has worked seven years in Emergency Management with an additional military equivalent experience of eight years. Education and training includes a Bachelors Degree from Kansas State University in Sociology and graduate studies at Chapman University, California in Education and Public Administration at Wichita State University (WSU), Kansas. Completed Certificates in Computer Applications and Supervision from WSU. A graduate of Squadron Officers School, Air Force Command and Staff College, and The National Defense University (NDU).

Completed the FEMA Professional Development Series (PDS) in 1994. Earned a Certified Emergency Manager (CEM) Certificate in 1995 through the International Association of Emergency Managers (IAEM) and has been re-certified to the year 2006. Resident Courses in Emergency Management at the Emergency Management Institute (EMI), Emmitsburg, Maryland include: Integrated Emergency Management Systems, Telecommunications and Warning, Emergency Support Function (ESF) 5, Community Relations Officer, Mission Assignments, National Emergency Management Information System (NEMIS), and the Planning and Analysis Courses.

Specialised training includes: Joint Operations Planning System, Hazardous Materials, Radiological, Incident Command Systems, and Nuclear, Biological, Chemical hazards.

His professional affiliations include the International Association of Emergency Managers, Emergency Information Infrastructure Partnership, the American Society of Professional Emergency Planners, Civil Air Patrol, American Radio Relay League ARRL, Disaster Emergency Response Association (DERA), Association of Public-Safety Communications Officials (APCO), National Emergency Management Association (NEMA), and the National Association for Search and Rescue (NASAR).

# Tertiary emergency management education in Australia

## Introduction

Over the past 15 years, emergency management in Australia has changed dramatically. We have seen the industry grow from dealing in basic disaster response planning and operations to one that now deals in all aspects of emergency management. Today the industry is heavily involved with emergency prevention and mitigation programs, risk assessment and analysis, essential service/ lifeline management planning, emergency management planning, emergency operations management and emergency recovery management. Today each State and Territory Emergency Management agency also provides specific emergency management training and awareness programs within their community for organisations and individuals who have emergency management responsibilities.

Similarly, the formalisation of emergency management education programs has also progressed over the past 15 years. Today, emergency management study programs are offered nationally by Emergency Management Australia (EMA) through the Australian Emergency Management Institute (AEMI) as well as by a number of Australian universities and higher education institutions. These programs are both short and long course in nature and cater to students studying full time on campus and also part time by distance education.

## A short history of the need and trends for tertiary courses in emergency management

During the mid to late 1980s, a number of emergency management agencies and tertiary education institutions within Australia identified the need for an increased level of emergency management education. Emergency management practitioners were being asked to take on increased responsibility in the areas of emergency management planning and operations without any formal emergency management education or qualifications.

In the late 1980s the Cumberland College of Health Sciences at the University of Sydney set up the Centre for Disaster Management.

The Centre offered a post graduate

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course in disaster management culminating in the award of a Graduate Diploma in Applied Science (Disaster Management).

In 1991 the Centre for Disaster Management at the University of Sydney was relocated to the University of New England's (UNE) Faculty of Arts under an initiative of the UNE commercial arm, University Partnerships. The focus at the time was on the development of Certificate and Diploma (Associate and Graduate) units in disaster management to enable workers in the disaster management field to obtain professional qualifications. The units were delivered by distance education.

In 1998, retirement, resignation and relocation of staff resulted in the cessation of UNE's disaster management program and the closure of the Centre for Disaster Management. The broad area of study was transferred to UNE's Faculty of Education, Health and Professional Studies under a new program focusing on Civil Care and Security. This program offers awards at Advanced Diploma and Bachelor levels in Professional Studies majoring in either Civil Care and Security or Policing. As with the previous Disaster Management program, all units are offered via distance education.

In 1988 the Tasmanian State Emergency Service (SES) recognised that there was a clear need to train emergency managers how to plan. The development of a prevention and preparedness training program for local government emergency managers was therefore given urgent priority by the Tasmanian SES. In 1989, in collaboration with the Tasmanian State Institute of Technology (incorporated within the University of Tasmania in 1991) and Emergency Management Australia, formalised training commenced. The program became an instant success and

as a result was further developed to include emergency operations management and emergency recovery management. In all, the program comprised 16 units of study to be undertaken over a three year period culminating in the award of an Associate Diploma in Emergency Management from the University of Tasmania. Delivery was 'face to face' ie. based on course work at residential schools and was financed by Emergency Management Australia.

In 1993 the Tasmanian State Emergency Service (SES) in collaboration with the University of Tasmania translated the 'face to face' course into a distance education format. In 1996, through an innovative product grant from the Federal Department of Industry, Technology, Regional Development and Tourism, the Tasmanian SES reviewed and updated the distance education format of the course.

The development of the distance education course was deemed necessary to meet the emerging needs of prospective students in other States, Territories and overseas.

In 1995 as the result of a change in policy at the University of Tasmania, the Tasmanian Associate Diploma program was transferred to Charles Sturt University (CSU). In association with the Tasmanian SES, CSU further developed the program into a 24-subject undergraduate degree with graduates being awarded the Bachelor of Social Science (Emergency Management). Students have the option of exiting the course after successfully completing 16 subjects and receive a Diploma. The course is offered via distance education over a four-year period. As with the initial Associate Diploma course, the target audience for the undergraduate course is emergency management practitioners.

In 1998, CSU commenced development of a post-graduate masters degree program in emergency management. This program is designed to compliment and continue on from the undergraduate degree program and comprises four 16-point subjects offered via distance education over a two-year period. The post-graduate program was initially offered for study in 1999. with successful

completion of the full program culminating in the award of Master of Emergency Management. The program also incorporates a Graduate Certificate in Emergency Management.

In 1997 Southern Cross University (SCU) recognised a need for alternative study options in the field of emergency management. At the time, SCU's existing emergency management programs focused primarily on logistics based disaster response, with very little in the area of community development and human services. SCU developed these two areas of study, culminating in a 12 unit Master of Community Development (Emergency Management) program.

This program also incorporates a Graduate Diploma and Graduate Certificate in Community Development. Southern Cross targets those involved in the human services field, particularly those with emergency management responsibilities.

In addition to those institutions mentioned above, a number of other tertiary institutions either already offer, or are in the process of developing, tertiary level programs or subjects related to emergency management. These include Edith Cowan University, Swinburne University of Technology, Kangan College of Technical and Further Education and RMIT University.

RMIT University is also currently in the process of developing a new Masters degree program across three Faculties covering management, social science and geo-spatial science. RMIT sees a need in the future for risk management and community recovery programs and research bridging these disciplines.

### **The professionalisation of emergency managers and the relationship of the tertiary sector in this development**

Today, as community and industry expectations of emergency managers grow, there is increasing pressure on emergency management agencies to professionalise their staff through targeted tertiary education programs in their particular specialist fields.

In a number of Australian states and territories Police officers going through basic training are either being encouraged, or required, to undertake undergraduate policing studies as part of their basic training. Similar steps are being taken within ambulance services in the pre-hospital care field and fire services in fire technology. It is interesting to note that elements of basic emergency

management are contained within each of these example programs. This move towards professionalising the emergency services and emergency management agencies may be indicative of the increased importance that our governments and communities are placing on comprehensive emergency management practices.

In addition to the agency specific courses described above, tertiary institutions are also offering emergency management courses, or components of courses, that focus in a particular area of emergency management. Examples include:

- Charles Sturt University's undergraduate and post-graduate Emergency Management programs which focus on general emergency management prevention, preparedness response and recovery practices and risk management
- UNE's current undergraduate and post-graduate Professional Studies programs which focus on civil care and security
- Southern Cross University's post-graduate program in Community Development with a major in emergency management and human services.

### **The need for development of emergency management staff supported by the tertiary sector outside of the usual courses, seminars, conferences etc.**

The provision of workplace related training courses, seminars and conferences is only a part of the educational support required by emergency management organisations and personnel. Tertiary education programs, crucial to the ongoing development and professionalisation of emergency management personnel, should be used to complement workplace activities and provide a formal qualification. The tertiary sector should be invited to participate in and support workplace training activities, thereby helping to break down the barriers between formal tertiary education and workplace training.

Support by the tertiary sector should also be provided to activities outside the usual workplace training activities mentioned above. To enable appropriate recognition of industry based programs, the tertiary sector and the emergency management industry need to take a collaborative pro-active role in identifying those industry based programs that are suitable for credit towards tertiary level programs. For example, Charles Sturt University has determined that some

courses offered by the Australian Emergency Management Institute have sufficient academic rigour to enable students who successfully complete them to receive some subject credits towards subjects within CSU's undergraduate emergency management program. In a similar vein, CSU has also entered into an agreement with a Philippines based emergency management training organisation, the Asia Pacific Disaster Management Centre, enabling one of their courses to qualify for a subject credit within CSU's post-graduate emergency management program.

Similar agreements between other tertiary sector institutions and the emergency management community would enable appropriate workplace training activities to qualify for subject credit within tertiary emergency management programs.

In addition to educational support for staff development there is also a need for support from research institutions. A number of Australian Universities currently house disaster/emergency management or hazard research centres. Notable amongst these are the Natural Hazards Research Centre at Macquarie University and the Centre for Disaster Studies at James Cook University. Other universities operate more specific research centres, among which are Queensland University's Advanced Centre for Earthquake Studies, the Australian National University's Centre for Resource and Environmental Studies and Charles Sturt University's Centre for Research into Cultural Risk.

The conduct and availability of research plays a major role in the ongoing development of knowledge, skills and abilities for emergency management personnel. As with the educational programs mentioned above, emergency management agencies should be actively working to develop linkages with these research institutions to ensure staff maintain the highest levels of industry practice and the emergency management community's body of knowledge is expanded.

In addition to research, the availability of emergency management related information is also crucial for ongoing staff development. Many government agencies, organisations, tertiary education and research institutions and industry groups maintain a wide and often comprehensive base of disaster/emergency related information.

Recently we have seen work commence in Australia on the development of the

Australian Disaster Information Network (AusDIN). The amalgamation of disaster/emergency information systems and their availability to the emergency management community is another important step towards improving emergency management capability and services.

### **The impact of tertiary emergency management programs on the emergency management industry**

The introduction of tertiary emergency management programs within Australia has resulted in some very substantial benefits to the Australian emergency management community.

Students within the various programs mentioned above represent a wide cross-section of the emergency management community within both public and private sectors.

Each program has improved the emergency management knowledge, skills and capabilities of their respective students and has had a positive effect within the emergency management communities of those students. In a number of instances there have been direct benefits to communities and organisations. These have included:

- the conduct of hazard analyses and risk assessments for specific communities, public and private enterprises—these have included ports, airports, emergency service agencies, essential service providers, recreational facilities, local government areas and government departments
- the development of specific emergency management plans, procedures, training and exercises related to the above analyses
- the analysis of the operational management emergency events within Australia and overseas—these have resulted in the identification of strengths and weaknesses of the management of those events and subsequent identification of recommendations to improve the management of future events
- the analysis of current emergency management and risk management issues and practices with the aim of improving that area of emergency or risk management.

The impact of these tertiary programs on the emergency management community is increasing.

As more and more students undertake emergency management education programs and transfer their acquired skills, knowledge and capabilities to their workplace, the potential benefit to the

emergency management capabilities of their organisations is increased.

### **The future regarding tertiary emergency management courses, the professionalisation of the emergency management community and tertiary staff development**

As the emergency management community evolves through participation in formalised tertiary education and staff development programs, there will also be a need for such programs to continually evolve. Staff teaching these programs need to be provided with the opportunity to develop their emergency management knowledge, skills and understanding to ensure that the programs remain relevant to the emergency management community's need and abreast with emergency management best practice.

Tertiary sector institutions and emergency management agencies should be encouraged to collaborate in this continual professionalisation of staff. Development of staff exchange programs and active participation in workplace related training, seminars and conferences are examples of strategies that could address this need.

### **Conclusion**

At the present moment tertiary emergency management programs offered within Australia vary in their context and focus. This variety of programs enables emergency management personnel to receive specialised and focused education relevant to their field of operation.

As the specialist fields within emergency management develop and expand into the future so will the need for educational programs relevant to these areas. In this regard the tertiary sector should ensure that it maintains close links with the emergency management community to ensure such changes and developments within the industry are incorporated within their educational programs.

Today our communities are evolving at an extremely fast pace. They are becoming better informed and able to determine their needs, and have rising expectations of government agencies and personnel.

Emergency management agencies and personnel are under increasing pressure from their communities to improve their emergency management capabilities and professionalism. One strategy that could address this need is the development of collaborative education and support programs between emergency mana-

gement agencies and tertiary education institutions.

Development of such programs would enable emergency management agencies to identify their ongoing educational and research needs. The identification of these needs would also enable tertiary educational institutions to provide programs that would benefit the emergency management community, improving their professionalism, capabilities and service to the community.

### **About the author**

Ian Manock is a lecturer in emergency management at Charles Sturt University with responsibility for coordinating subjects in CSU's undergraduate emergency management program. Ian is also the coordinator of the Australian Emergency Management Forum, an online emergency management facility maintained by CSU. Prior to joining CSU, Ian worked for nine years with the Tasmanian State Emergency Service as a Regional Emergency Management Officer and prior to that was a Senior Inspector in the Royal Hong Kong Police Force. Ian holds a Bachelor of Social Science (Emergency Management) and is currently studying towards a Master of Emergency Management. Ian's address is Lecturer—Emergency Management School of Public Health Charles Sturt University phone: 02 6338 4907 fax: 02 6338 4993 email: imanock@csu.edu.au

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- Professor Russell Blong, Natural Hazards Research Centre, Macquarie University
- Mr. Anthony Ralph, Kangan TAFE
- Mr. Peter Koob, Senior Education Officer, Australian Emergency Management Institute.

**This article has been refereed**



# Book Review

## Natural Perils in Australia and New Zealand

by Russell Blong, David Sinai and Colin Packham

Published by Swiss Re Australia Ltd 2000  
ISBN: 0 646 40547 0

Reviewed by Ken Granger

Geographer

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The major reinsurance company Swiss Re have, for many years now, published some of the best written and illustrated manuals and discussion papers on natural hazards and the risks that they pose. For example, Herb Tiedermann's massive *Earthquakes and Volcanic Eruptions: a Handbook on Risk Assessment* (published in 1992), and its accompanying *Catalogue of Earthquakes and Volcanic Eruptions* (revised in 1993), is widely regarded as a standard text, whilst Christian Brauner's *Global Warming: Elements at Risk* (published in 1994) is certainly one of the more insightful documents on the subject. This tradition of excellence has been well and truly preserved with the issue, by Swiss Re late in 2000, of *Natural Perils in Australia and New Zealand*, written by Russell Blong, David Sinai and Colin Packham.

The authors pack into this work's 120 pages a wealth of information on the hazards that pose a risk mainly to the domestic property portfolios of the insurance and reinsurance industries. In spite of its somewhat targeted audience, *Natural Perils in Australia and New Zealand* is an outstanding resource book for anyone with an interest in the hazard phenomena, their history of impact and their potential for future impact, in this part of the world. It is clearly written with a minimum of technical language and, as is the hallmark of Swiss Re publications, exceptionally well illustrated.

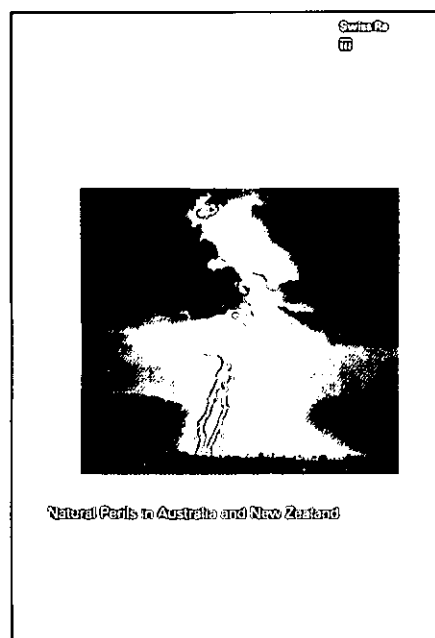
The hazards covered are grouped into two categories: tectonic perils (earthquakes, volcanic perils, tsunamis and landslides); and meteorological and associated perils (cyclones, thunderstorms, floods and bushfires). Each section begins with a broad introduction and an explanation of some of the key concepts and terminology. For example,

early in the tectonic perils section the differences between earthquake 'magnitude' and 'intensity', and the meaning of the Richter Magnitude scale are explained in supplementary texts, whilst the El Nino—Southern Oscillation (ENSO) phenomenon and its significance is described in some detail at the beginning of the meteorological perils section.

The various perils are illustrated by contemporary descriptions of significant historic events such as the great 1885 Wairarapa (Wellington) earthquake (M 8.0–8.1); the impact of the tsunami generated by the 1868 Chile earthquake (M 8.5) in Newcastle (NSW) harbour; the 1979 Abbotsford (NZ) landslide which involved 5.4 million cubic metres of material and destroyed 69 houses; Cyclone Tracy and the 1918 Mackay cyclone; and the 1999 Sydney hail storm. Scenarios are also presented to illustrate the potential for future major events such as a M 5.5 earthquake with its epicenter under Botany Bay; and, a volcanic outburst in the centre of Auckland.

Some interesting and useful comparisons are made between the risk environments of Australia and New Zealand and some of the responses developed. Perhaps the most significant of these differences is the publicly funded New Zealand Earthquake Commission (EQC) which came into being in the early 1940's. EQC provides insurance cover for homes, contents and the land the home is on against earthquakes, landslides, volcanic eruptions, hydrothermal activity and tsunamis automatically when home or contents fire insurance is purchased from a private insurance company. It also provides cover against storm and flood damage to residential land, but this cover does not include the house or its contents. This is in clear contrast with the insurance situation in Australia which is entirely in the private sector and, for the most part, does not include cover for landslide, tsunami, storm tide or riverine flood.

The work concludes with an interesting section on 'catastrophe modelling and PML (probable maximum loss) estimation'. This provides a very helpful insight into the way the insurance industry establishes its risk exposure to natural hazards. The methodology employed by Swiss Re 'four box model' is very similar to the approach adopted by



the standard AS/NZS 4360-1999 *Risk management*.

A number of observations are made throughout the work that clearly resonate with many of us who have been working in the risk management field for some time. For example, in relation to flood risk, the authors observe:

*Australian expertise is the equal of world best standards in all aspects of floodplain management, from hydrology to emergency planning. The challenge is how to translate that knowledge into best practice floodplain management. Regrettably, many of the barriers to successful urban flood risk reduction are institutional.*

Observations of similar candor are made about the nature of the information used by the insurance industry to assess portfolio exposure, for example, after drawing attention to the desirability of differentiating construction types in assessing earthquake risk, they state:

Likewise, different subsoil conditions generate marked variations in the intensity of ground shaking, and hence damage, indicating that insurers need to identify specific construction types on particular soils if they are to manage risk successfully. The clear implication is that insurers need to know the location of insured risks to within tens of metres rather than just within postcodes.

It is clear that many emergency managers would also like such a high resolution understanding of the risks they may have to cope with.

# The application of risk management principles to municipal emergency management practice

## Introduction

Charleville and Augathella are located adjacent to the Warrego River in the Shire of Murweh in far Western Queensland and have a history of flooding. In 1990 a record flood of 8.54m was experienced at Charleville that resulted in major evacuations, disruption to essential services (including telecommunications) and significant economic and social consequences in both towns. Recovery bills totalled in excess of \$71.6m.

Two flood studies were undertaken following this flood (Scott and Furphy 1991; Kinhill, Cameron and McNamara 1993) and recommended a suite of structural and non-structural solutions to the flooding problem. However, and in large part due to a lack of community consensus on the most appropriate actions, recommendations had not been acted upon before another major flood in 1997, which reached a height of 7.39m occurred at Charleville, again with serious consequences.

Against this background the Queensland Department of Emergency Services commissioned a Flood Risk Study for Charleville and Augathella in mid-1997 aimed at establishing vulnerability to flooding and barriers to the implementation of past study recommendations. Two main deliverables were sought: a list of intervention strategies to address community vulnerabilities to flooding, and the development of a methodology for local disaster management planning based on AS/NZS 4360: 1995 - Risk Management.

During 1999 the Queensland Department of Emergency Services commissioned another study (Qld Risk Management Consultants Pty Ltd 2000) to further develop and refine the disaster risk management process established as part of the Murweh Shire study. The study was conducted in the Local Government areas of Cairns, Harvey Bay and Mackay. It addressed multi-hazards in large urban environments as distinct from the Murweh Shire study, which dealt with a single hazard (flooding) in a rural environment.

by Ken Durham, Disaster Policy and Research Unit, Department of Emergency Services, Queensland, Michael Cawood, Geo-Eng Australia Pty Ltd and Roger Jones, TEM Consultant.

The three cities were chosen because of their exposure to a range of hazard events and the diverse nature of their communities.

The refined process/product will be made available with appropriate training to all Local Governments in Queensland. The methodology is applicable to all Local Governments in all other States and Territories.

This paper discusses the study processes and presents a methodology for applying the risk management process specified in AS/NZS 4360 to emergency risk management that is applicable to and can be used by all Local Governments.

## Risk management approach outlined

### The Australian/New Zealand Risk Management Standard

The Standard, hereafter referred to as 'AS/NZS 4360', provides a generic framework for the identification, analysis, assessment, treatment and monitoring of risk. It is focused on the needs of single organisations, independent of any specific industry or economic sector. AS/NZS 4360 emphasises that the design and implementation of a risk management system within an organisation, while drawing on the elements of the risk management process specified, would be influenced by the varying needs of that organisation, its particular objectives, its products and services, and the processes and specific practices employed.

### Applying AS/NZS 4360 to Public Safety Risk Management

While AS/NZS 4360 is by design generic and specifically organisational in context,

it can be seen to have application in the multi-organisational context of public safety risk management.

This has been recognised in the area of disaster and emergency risk management by the Australian National Emergency Management Committee (NEMC) which in 1996 directed that guidelines be developed for the application of the risk management process specified in AS/NZS 4360 in a disaster and emergency management context.

Early drafts of the emergency risk management guidelines informed the studies (EMA 1997) and while the guidelines have now been agreed nationally, work continues on developing them into detailed planning materials. As the Longford (Victoria) gas crisis in September 1998 demonstrated, more work needs to be done in addressing such public safety risk concerns as security of supply in the area of essential services.

## The emergency risk management process

Emergency risk management processes must take account of the need to adapt the generic framework and process of AS/NZS 4360 to public safety concerns. This requires recognition that the 'strategic and organisational contexts' of public safety emergency risk management inevitably involve all three spheres of government and that the 'risk management context' of emergency risk management is fundamentally about the protection and preservation of life, property and the environment within a designated community.

Steps in the emergency risk management process are drawn down from equivalent steps in AS/NZS 4360 and show clear parallels with both generic terms and processes. A comparison of terminology is presented in *Table 1*.

Risk is defined in AS/NZS 4360 as 'the chance of something happening... measured in terms of consequence and likelihood', and thus the focus of risk management is largely upon events, in terms of what can happen, and how and

why it can happen. In the emergency risk management context, however, risk is more than an aggregation of the products of the consequence and likelihood of separate hazards: it is a complex interaction between hazard, community and environment. Identifying and profiling community vulnerability to hazard is thus an essential part of the emergency risk management process.

A diagram of the suggested emergency risk management process (incorporating an 'Establish Community Vulnerability Profile' step), as a revision of the process depicted in AS/NZS 4360, is shown in Figure 1. The diagram also shows the need for the profile to be employed in the 'Identify, Evaluate and Implement Interventions' step.

## Disaster risk management studies

### Context

The following factors are relevant in establishing the framework for public safety risk management planning at Local Government level in Queensland and were of specific relevance to the Murweh Shire Flood Risk Study (Geo Eng Australia Pty Ltd 1998) and the Local Government Disaster Management Project in Cairns, Mackay and Hervey Bay:

- State initiatives, including the policy shift at State level to a comprehensive, all hazards, whole of Government and integrated public safety approach to the management of all risks, and other external influences which impose Local Government obligations and responsibilities in relation to public safety
- existing local administrative and planning policies, arrangements and processes which bear on public safety.

### State initiatives and other external influences

The *Integrated Planning Act 1997* (IPA), is designed to facilitate the coordination and integration of planning at local, regional and State level and to ensure that balanced ecological, economic and social outcomes are achieved for future development proposals.

Disaster and emergency planning arrangements and processes clearly need to be cognisant of the public safety impacts of decisions under the IPA arrangements and, similarly, public safety issues need to be addressed in the development of local planning schemes, corporate policies and town plans. Actions taken in the name of the town plan, corporate plan or local planning scheme are likely to have an immediate or long-term impact on public safety risk man-

Generic management	Risk management (AS/NZS 4360)	Emergency risk management
problem definition	establish content	establish emergency risk context
analysis	identify risk	determine evaluation criteria; characterise hazards, community and environment; establish community vulnerability profile
analyse risks	analyse risks	
decision making	evaluate risks	evaluate and rank risks
implementation	treat risks	identify, evaluate and implement interventions

Table 1: Comparison of terminology

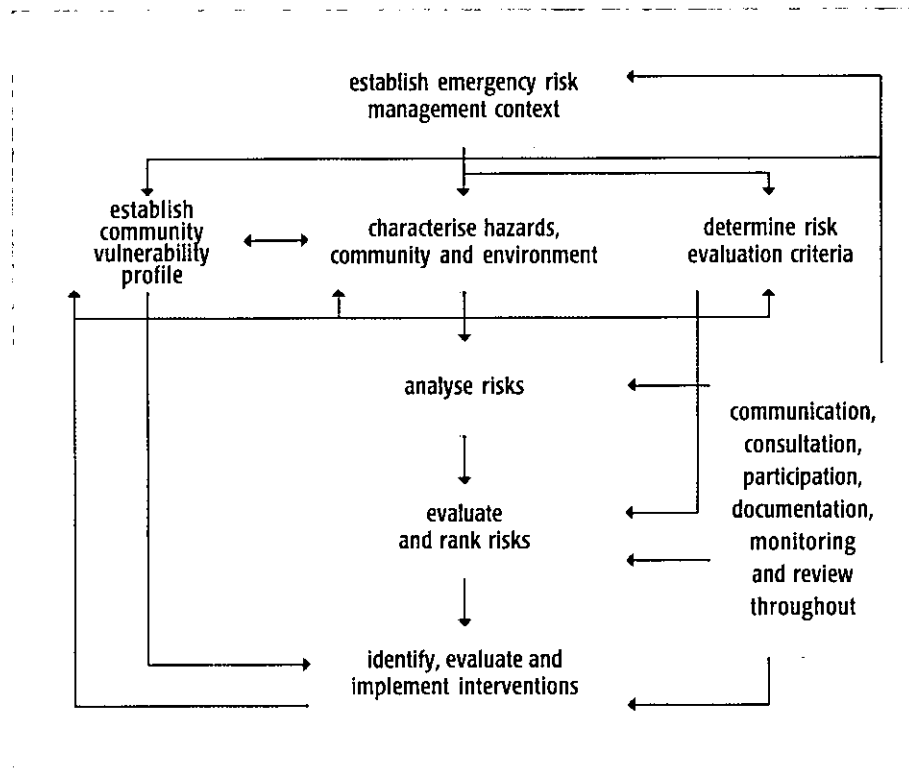


Figure 1: Main elements of the emergency risk management process

agement arrangements. For example, unless the implications for the community of a development approval are taken into account in a disaster management context, that approval is likely to perpetuate ongoing disaster management problems and escalate the cost of recovery.

The recent *Protocol between the Queensland Department of Emergency Services and the Local Government Association of Queensland Relating to Disaster Management and Local Government Volunteer SES Units* provides a framework for the creation of a commitment from Local Government to include disaster planning and support for their volunteer State Emergency Service (SES) Units as part of their normal business functions. It also reflects new directions in Queensland in treating disaster management as an integral part of 'whole of government'

public safety arrangements and is reflected in current state counter disaster planning philosophy. The new arrangements will provide a mechanism for local and State governments to jointly develop appropriate provisions in such areas as indemnities, common law responsibilities and duty of care.

It is of interest to note that New South Wales already provides exemption, in legislation, for Council and its staff from future action over duty of care for flooding decisions provided that the guidelines given in the New South Wales Floodplain Development Manual are followed.

Other potential or actual external influences on local planning frameworks include:

- specific State legislation and policy to implement effective urban and rural

floodplain management, including Best Practice Manuals such as the national manual 'Floodplain Management in Australia'

- the national Murray Darling Basin Agreement, and specifically the provisions of Clause 46 which relates to the protection of the rights and interests of downstream users/States
- Commonwealth Natural Disaster Relief Arrangements (NDRA) that are now formulated to promote effective mitigation activities at State level by linking the extent of NDRA funding for likely or re-occurring disaster events to the existence of disaster mitigation actions or plans (where such actions are feasible)
- Commonwealth and State Environmental Protection Acts that require that the impact of mitigation options on the environment be taken into account when considering the various risk treatment strategies.

Issues of floodplain management in Queensland are exacerbated by the lack of a policy and administrative framework and the inconsistent application of Local Government powers. As a result there has been a growth of flood-prone developments and the potential for future flood damage has continued to increase. The four Local Government areas in which this series of studies were conducted are no exception.

**Existing policies, arrangements and processes in the study areas**

Existing policies, arrangements and processes with direct bearing on public safety risk management generally, and disaster management in particular, are detailed in several documents, namely, the

*State Counter Disaster Organisation Act 1975*, the *State Disaster Plan Queensland* and in the Council's Corporate Plan, Town Plan and Counter Disaster Plan.

Public safety and disaster management are issues that must be addressed by Local Government under the present Queensland arrangements.

**Application of the risk management approach**

The process described in *Figure 1*, including the added step of establishing a community vulnerability profile, was applied in the studies.

**Establishing the emergency risk management context**

The policy and organisational contexts were established by the study briefs. This information was supplemented by meetings with the Project Management

Board (PMB), discussions with Brisbane and locally based agencies, study of background material, reports, relevant existing and pending legislation and other documentation. This step also involved a series of meetings with key stakeholders: the citizens of the Local Government areas being studied.

The various modes of stakeholder and community consultation used in the studies is outlined in *Table 2*.

**Risk evaluation criteria:** The key criterion developed for evaluating the risks was, in terms of significance and acceptability, whether the hazard event was likely to cause significant damage and disruption. If so, the risk was unacceptable. This was derived from the community itself indicating a general acceptance of an element of risk associated with events up to a certain threshold level but very low acceptance of risk above that level, although the degree of risk considered 'acceptable' by individuals and community sectors varied considerably.

**Characterising the hazard, the community and the environment.** This was materially assisted by the Councils, reference groups, community and agency discussions during visits to the study areas and was supplemented by research and Australian Bureau of Statistics (ABS) data.

A process of *recording and profiling community vulnerability* to the identified natural hazards was instituted, based upon an assessment of the interaction of the hazard, community and environment. Consideration of the variety of factors identified in the literature as relating to community vulnerability—the susceptibility and resilience of a community and its constituent elements to risk—was limited to those which offered some

opportunity for measurement. It was recognised that appropriate instruments for recording and profiling community vulnerability to risk, developed in the Murweh study, would require further development and validation. This was achieved in the studies undertaken in Cairns, Mackay and Hervey Bay.

The community vulnerability profile, developed for the Murweh study and tested in the study in Cairns, Mackay and Hervey Bay, is shown in *Table 3*

The *analysis and evaluation of risks* was undertaken progressively throughout the studies. The step of ranking risks, inclusive of all hazards, was generally undertaken during this process although in the case of Murweh Shire it was deleted as flooding was the sole hazard considered. The analysis included modelling of the interaction between the hazard, the community and the environment and the evaluation of risks was undertaken in the context of the risk evaluation criteria established earlier.

An *identification of potential intervention strategies* was undertaken in the final stages of the project, and a preliminary evaluation of those intervention strategies carried out against the community vulnerability profiles established earlier. The preliminary evaluation of potential intervention strategies was then tested with the PMB, the Council, reference groups, stakeholders and communities in the study areas.

Criteria for identifying and evaluating individual intervention measures evolved from discussions with the Council, community members, reference groups, and stakeholders and included:

- recognition that natural disasters will continue to occur and that they cannot be stopped

Murweh study	Cairns, Mackay, Hervey Bay study
Combined meeting of Brisbane based stakeholders.	Group and face to face meetings with Brisbane based stakeholders.
Small group meetings with local agency stakeholders including Council staff	Small group meetings with local agency stakeholders
Full Council	
Community reference groups	Community reference groups
1800 phone number	1800 phone number
Walk and chat	Walk and chat including door knocking
Local paper articles	Local paper articles
Drop in centre	
Radio talk back	Radio talk back and TV interviews
Public meetings	
	Shopping centre interviews and information booths.

Table 2: Modes of Stakeholder and Community Consultation

- general recognition that there is no one solution
- any measures need to be practical and affordable (issues of efficacy, benefit and cost)
- no one should be worse off (issues of equity).

All of the studies were based on an extensive program of *communication, consultation, participation and documentation*. Regular reports to and meetings with the PMB ensured effective *monitoring* of the studies.

### Study outcomes

#### Risk reduction measures

The recommended risk reduction measures put forward to the Councils represented the out-workings of the comprehensive consultation process. While particular individuals and groups displayed considerable strength of feeling on the efficacy and desirability of particular 'solutions' to the identified problems, it was clear that they recognised there are a range of possible 'solutions' available. It was also recognised that no one 'solution' was likely to deal satisfactorily with the problem and be acceptable to all interest groups. None of the measures put forward are sufficient by themselves: there are significant dependencies between the measures which involve a mix of structural and non-structural solutions. It was also made clear to Councils that additional interventions worthy of further consideration may be identified as the Council and the community worked through the issues in the coming years.

Action is required to effectively reduce the risks in all of the study areas. The time frame for such action is dependent on factors such as:

- feasibility in terms of political and funding opportunities
- practicability
- future strategic planning directions adopted by Council
- community acceptance both from the point of view of residual risk, aesthetics and quality of life
- overall cost and willingness of the community to pay initial and on going costs.

The measures were not prioritised as this is seen to be a joint responsibility of Council and the community. In the case of Murweh Shire they were grouped under Must Do, Should Do and Could Do headings to indicate the broad priority, in terms of immediacy and urgency of action, attached to each grouping. For Cairns, Mackay and Hervey Bay the options were presented in the broad

Vulnerability assessment framework		←—————→				
Key factors (see attachment: key factors and vulnerability indicators)	Less Vulnerable		More Vulnerable			
	1	2	3	4	5	
a. Location of residence	1	2	3	4	5	
b. Suitability of Residence						
c. Location of livelihood						
a. Financial resilience/susceptibility						
b. Knowledge of appropriate protective behaviour						
c. Capability to undertake appropriate protective behaviour						
d. Health						
e. Social network						
a. Community planning processes	1	2	3	4	5	
b. Mitigation measures						
c. Response/recovery capability						
a. Lifelines						
b. Items of economic significance						
c. Items of environmental and/or cultural significance						
a. External government planning processes	1	2	3	4	5	
b. Mitigation policies						
c. Response/recovery support capability						

*Note: This tool identifies key factors which can be easily measured and provide necessary and sufficient information to inform judgments about vulnerability.*

Table 3: Community Vulnerability Profile (after Salter 1997)

categories of 'non-structural', that included a number of administrative issues, and 'structural'.

#### Implementation of risk study recommendations

Murweh Shire Council has presented the findings of their study to the community. As a result of this consultation it was resolved that all non-structural recommendations would be implemented and that levees would be built at Charleville and Augathella as a long-term solution subject to the availability of funding from the three levels of Government.

Cairns, Mackay and Hervey Bay Councils are yet to consider the findings of the studies in their areas and determine an appropriate course of action.

#### The template

One of the requirements of the study in Murweh Shire was the delivery of an all-hazards methodology for the application of AS/NZS 4360 to the development of disaster management plans that could be applied in other Local Government areas.

The methodology was developed and refined during the course of the study and presented as a template. The methodology was used in the studies at Cairns, Mackay and Hervey Bay where it was further refined.

#### Important considerations

There are two important considerations in the application of the methodology developed.

Firstly, it is a suggested methodology: a form of procedure or process. As detailed processes for the application of AS/NZS 4360 to the management of community emergency risk are still evolving, the content of a number of the steps described in this paper may need to be refined as experience in the use of the methodology is gained.

Secondly, it needs to be recognised that there are three key participants involved in the application of this process, and effective input from all three is required if the process is to lead to the required outcome of a safer local community:

- State Governments, which must provide

planning formats and guidelines, liaison, advice, effective facilitation where needed and general oversight of the planning process

- local Governments, which must manage the process at local level and oversight the implementation of outcomes of the process
- the community itself, which must be given the opportunity to make effective input to the process through a planned and interactive consultation program.

### Future application of the risk management approach

#### General comments

The risk studies described above were conducted against a background of community distrust of past Council actions and some Government inaction over possible solutions to risks generally. It will be appreciated that this coupled with the conduct of earlier studies in each of the Local Government areas, that had tended to polarise the community views on the practicability and efficacy of recommended non-structural and structural mitigation options and led to some difficulties in the conduct of the studies. A coherent process such as that suggested within the template needs to be followed from the outset in the conduct of any disaster risk management study.

#### Issues of policy

It is evident that there is a range of Commonwealth and State policy matters that influence the development of mitigation strategies (e.g. requirement under NDRA that future financial relief arrangements be related to risk mitigation practices).

Flooding is the single major hazard facing Local Governments in Queensland however the institutional and legislative mechanisms used to underpin flood policy in Queensland are unclear. Local Governments in Queensland are moving to adopt and implement urban floodplain planning practices that embrace non-structural planning measures. This move does not stem from a formal requirement of the State Government but appears to be driven by a desire to implement good management practice and a concern at Local Government level over liability under duty of care (see in particular Smith D.I. 1997).

There is a clear need to develop and implement specific State policy to ensure effective urban and rural floodplain management. This would give clear direction on agency roles and responsibilities and allow completion of a

comprehensive State floodplain management policy and manual. There is also a clear need for the Queensland State Government to address issues of indemnity, particularly with respect to floodplain management, and to define the term 'public safety'.

It is considered that in general these policy issues, particularly in relation to NDRA funding, are applicable to a majority of Local Governments across Australia.

#### Recent developments in Queensland

The State Government has provided an incentive to Local Governments with a \$3m rate revenue base or less to undertake disaster risk management studies. The submission of an acceptable interim disaster mitigation plan will result in the NDRA trigger point for that Council being lowered from \$77,000 to \$50,000. At the time of submitting the plan the Council gives an undertaking that it will complete a full disaster risk study by 31 March 2002.

A Queensland Flood Coordination Committee (QFCC) has been established to develop a State Floodplain Management Manual and a position paper on the need for a State policy on floodplain management.

The Department of Emergency Services in conjunction with the Local Government Association of Queensland Inc. has undertaken an extensive Awareness and Education Program for Local Governments on the application of the risk management process in a disaster context.

The methodology used in the risk studies described in this paper has also been documented for distribution to Local Governments in Queensland. Local Governments who follow the process will develop mitigation options and implementation plans that will assist in ensuring the continuity of NDRA funding. The implementation plans must include timelines that indicate when various elements of the mitigation options will be implemented.

The Department of Emergency Services has developed and distributed to all Local Governments in Queensland the following publications; *Disaster Risk Management*; and *Disaster Risk Management Guide: A How to Manual for Local Government*; that outline the risk management process in a disaster context.

The Commonwealth Government has introduced two funding programs to assist Local Governments to address mitigation issues: one provides funds for risk management studies the other for flood mitigation works.

#### Conclusion

The risk studies addressed in this paper provided the first real opportunity to apply the National Emergency Risk Management Guidelines based on AS/NZS 4360. Both the Guidelines and the standard on which they are based have proved a major innovation in the management of community risk and have significant implications for future comprehensive and integrated emergency risk management.

The process provides outcomes, which must be reflected in the corporate, strategic, operational and counter disaster plans of Councils. The documentation of the outcomes together with the establishment of short, medium and long-term implementation timelines will meet Commonwealth Government guidelines for the continuing provision of NDRA funding.

There is a clear need to develop and implement specific State policy and guidelines to ensure effective floodplain management.

There is also a clear need to address issues of indemnity particularly with respect to floodplain management and to define the term 'public safety'.

These policy issues and the application of the risk management process to community risk management are applicable to all Local Governments in Australia.

The major outcome achieved by these studies was the development testing and documentation of a disaster risk management process based on AS/NZS 4360. The Department of Emergency Services will provide a copy of the documented process to every Queensland Local Government.

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New South Wales Floodplain Development Manual.

### About the Authors

#### Ken Durham

Ken Durham has 44 years experience as a local government engineer in New South Wales and Queensland and has spent the last 3 years working with the Department of Emergency Services managing the various local government disaster risk management projects referred to in this paper.

From 1972 to 1997 Ken was employed by Ipswich City Council Queensland in a number of positions including deputy city engineer and resources manager. Throughout his years with Ipswich City Council Ken was the manager of the Council's flood control centre and he was instrumental in the installation of the first A.L.E.R.T. system in Queensland on the council streams. He is the Local Government Association of Queensland representative on the Flood Warning Consultative Committee, and the Total Management Planning Floodplain Management Committee. He also represents the Department of Emergency Services on the Dam Safety Policy Advisory Committee and a State Committee developing a position paper on the need for a State Policy on floodplain management.

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#### Michael Cawood

Michael Cawood has more than 22 years professional experience in the areas of hydrology and flood management and has a masters of Engineering Science Degree. He has been involved in the investigation and strategic assessment of water resource engineering and floodplain management projects and has particular experience in operational and surface water hydrology and associated areas such as flood management.

Prior to joining Geo-Eng, Michael led the Bureau of Meteorology's Hydrological Services Program in Victoria for more than 8 years and had responsibility for planning, coordination, development and management of the flood forecast and warning program. This involved significant involvement in emergency management planning matters.

Since joining Geo-Eng in 1996, Michael has worked extensively on flood management consultancies and was part of the team that prepared the Emergency Management Australia sponsored national Best Practice Guidelines on Flood Preparedness and on Flood Warning.

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#### Roger Jones

His last posting in a 21 year Australian Regular Army career was as Principal Staff Officer, Operations (Colonel) in the then newly-formed Natural Disasters Organisation in Canberra.

From 1976 to 1984, he was Deputy Director and Chief Instructor at the Australian Counter Disaster College (now Australian Emergency management institute) at Mount Macedon in Victoria.

In the aftermath of the 1983 Ash Wednesday fires in south-eastern Australia, he worked with the Victorian Government in reviewing that State's emergency management arrangements and was responsible for the introduction of the Emergency Management Act 1986. He returned to the Mount Macedon establishment as Director in 1987 and took early retirement in 1994 to pursue consultancy opportunities in emergency and disaster management.

He has worked extensively in that field for UN agencies, other governments and the Australian federal and State authorities as a consultant in emergency management policy, education and training. His work has been published widely, and he is a regular contributor to major national conference and workshops.

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## Announcement

### Resilience and vulnerability assessment

A report and associated guidelines on assessing personal and community resilience and vulnerability have recently been completed for Emergency Management Australia.

These documents have been prepared by Philip Buckle, Graham Marsh and Sydney Smale. Their research focuses on the social dimensions of vulnerability but endeavours to locate it within the broader contexts of social, economic and environmental change.

Their research involved extensive consultations with local people and agencies across Victoria, Australia, and derives some lessons and observations that may challenge some preconceptions of the emergency management community.

Comments and critical appraisal are welcome.

*The authors are following up this study with complementary research examining approaches to effective implementation of resilience and vulnerability assessment.*

Exposure drafts of the report and the guidelines are available at [www.ls.rmit.edu.au/landinfo/landinfo/Riskhome/Risk1.htm](http://www.ls.rmit.edu.au/landinfo/landinfo/Riskhome/Risk1.htm)

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# A culturally sensitive approach to risk? 'Natural' hazard perception in Egypt and the UK

## Introduction

In recent years there has been an increase in the volume of literature exploring the concept of the 'risk society' (e.g. Giddens 1990, 1991; Douglas 1992; Beck 1992a, 1992b, 1996). A key aspect of this has been the consideration of ways in which the hierarchical relationship between experts and lay people is changing, from the primarily 'top down' to the 'bottom up'. Simultaneously, and as a function of the diminishing authority of 'the expert', there is recognition of imbalances of power between experts and lay-people and a need to redress this through more culturally-sensitive approaches towards the sharing of knowledge.

This paper attempts to reconcile some key points from this literature in relation to natural hazard perception. This will be achieved by firstly considering some of the theoretical discussions that have been taking place before highlighting the salience of some of these points through case study material from Egypt and the UK. Finally, the paper makes some suggestions as to the ways in which some of these points might be incorporated into 'natural' hazard mitigation.

## Theoretical considerations

### Social theory and hazards research

One of the main contemporary issues in hazards research has been to bridge what has been termed the 'risk archipelago' and to develop a reflexive approach towards environmental risk that is inclusive of other discourses (e.g. Cutter 1994; Hood and Jones 1996). Indeed, there have been a number of recent attempts to reconcile natural hazards research and social theory with a view to gaining a more holistic understanding of how individuals interact with the hazardous natural world (e.g. Wildavsky and Dake 1990; Blaikie et al. 1994; Hewitt 1997; Bolin 1998).

A particularly important aspect of this is that in recent years there has been recognition that the certainty and meta-narrative that has pervaded many aspects of social research has begun to lose tenacity in favour of more postmodern,

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eclectic understandings and interpretations of the world. One of the main outcomes of this has been to acknowledge that power relations are a significant part of both understanding people's marginalisation but, simultaneously, that they are also a part of the research process that seeks to reverse this situation of disempowerment. Therefore, it is important to look to wider discourses, as well as within hazards theory per se, to gain an understanding of some of the processes taking place with regard to the social status of knowledge, as well as to the relative positions of the 'researcher' and the 'researched'.

### Power relations

Recent social theory has illustrated that the prevailing discourses within a society are loaded with meaning as opposed to being impartial. These meanings associated with discourse can have implications with regard to power relations. Indeed, Foucault argues that knowledge is power over others and that 'a discourse embodies knowledge (or, rather, what it defines as knowledge) and therefore embodies power' (Craib 1992 p.186).

Since the power to act in a certain way depends on the 'knowledge' that is current within the society at the time, discourses can be drawn upon to justify particular actions. This is because, certain discourses have tenability in particular societies, i.e. discourse is context-dependent. Such discourses may also be termed 'privileged knowledge' (Peet and Watts 1996) implicating more specifically the importance of access to particular knowledge in gaining status in society. Power may therefore be seen not as residing with individuals, but as a function of these prevailing discourses that exist

within the society concerned. If the world can therefore be defined, through these discourses, thereby producing 'knowledge', in a way that is advantageous then this is to exercise power (Burr 1995). The means to empower people, then, is to enable them to have access to the privileged knowledge in society from which they are then able to take a critical stance against discourses of disempowerment and marginalisation.

### The changing role of the expert

Paralleled to the notion of power relations and privileged knowledge is the changing role of the expert; hazards theory needs to respond to the idea that people no longer automatically accept 'expert' interpretations of environmental phenomena. Instead, there is a cynicism with regard to the status of 'expertise' within many social situations. Thus, within the context of environmental interpretation it is important to characterise the expert as an interpreter, i.e. a facilitator, rather than a legislator, i.e. someone who provides authoritative comment (Bauman 1987, 1992); there are so many understandings with regard to the environment that to search for a definitive account is futile. As such, there can surely only be (mis)interpretations (Geertz 1973, 1983) of the natural world, even within science which is frequently portrayed as having the definitive answers to many problems/phenomena encountered. Indeed, literature pertaining to discourses of 'risk' and the 'risk society' is acknowledging this shift towards interpretation (e.g. Giddens 1991; Beck 1992a, 1992b, 1996).

In this situation, the expert is no longer the autonomous voice on matters of risk, lay-people have an important part to play as well and can force the direction of scientific, or other, enquiry through their concerns. It is not simple to make judgements and decisions about the environment therefore, as meaning is given to nature through social interaction. Instead, risk needs to be tackled in a more constructivist manner which recognises the contribution made by ordinary



people to the discourse. Indeed, Beck (1996 p. 20) recognises this argument by maintaining that, 'there are no expert solutions in risk discourse, because experts can only supply factual information and are never able to assess which solutions are culturally acceptable'.

The notion of the possibility of only making interpretations is even more germane if the numerous cultural and social differences are considered. A statement about the environment can thus be cast only as *an*, rather than *the*, interpretation and this is the situation that distinguishes interpreters from legislators. In addition, the relationship between interpreters and legislators will vary between cultural contexts and this could have a considerable bearing on the way that suggested interventions are received within a community. These idiosyncrasies and subtle differences should also be considered by hazards researchers.

### 'Who fears what and why?' Debates in risk perception

Many of these issues have been highlighted in the growing and specific literature on risk perception from a sociological, psychological and cultural perspective and it is pertinent to refer to this literature in order to further contextualise empirical observation. Within this context, Löfstedt and Frewer (1998) have noted the various paradigm shifts that have occurred within the discourse of risk perception. In particular, Slovic (1987) notes that 'Sociological and anthropological studies have shown that perception and acceptance of risk have their roots in social and cultural factors' (p. 32). This iterates the need to gain a wider understanding of the parameters that impinge on people's worldviews before pragmatic steps can be taken in order to reduce risk, in this case from 'natural' disasters.

Psychological, social, cultural and institutional parameters are also important because of the ways in which these can lead to a social amplification of risk when they interact with a hazard (Renn 1991). The social amplification of risk theory, developed by Kasperon et al (1988), is particularly pertinent in looking at the ways in which risk messages are disseminated throughout society and the reasons for which they are either amplified or attenuated. Such amplification or attenuation is linked to both wider discourses that affect how a particular society defines risk as well as context-specific characteristics present in society at a particular time that might affect

response and/or perception. It is only by understanding such background factors that perception can be wholly understood.

From a pragmatic perspective, risk literacy, i.e. the way people understand and synthesise information on the topic of risk and then practically act upon it, is linked to many of these issues. Thus, in order to raise awareness of a particular risk within a community it is necessary to consider many of the specific social, cultural and psychological issues that are present within it.

### Empirical observations

Many of these theoretical aspects have principally been applied to risks and hazards that result from modernisation. However, there is much that has an

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application for 'natural' hazards. In particular, it is interesting to see how cultural context and social constructions of the environment affect the ways in which people perceive, and consequently respond to, environmental risk. This paper gives a brief overview of the ways in which this was done with regard to two cultural contexts, Egypt and the UK.

The case studies explore contrasting scientific understandings of two different hazard events in the context of the changing social structure of Egypt and the UK. Egypt is a society where tensions exist with regard to modernity (and western forms of science), owing to discourses of religion. In terms of the science-religion interface it was thus considered an important area for research. These tensions were well exemplified by the Dahshūr earthquake in October, 1992. In addition, many of the people affected by the earthquake live in village environments

and therefore build their own houses—understandings of people-nature relations are thus of great pragmatic significance in these circumstances.

In terms of the UK, claims to post-modernism; an increasing incredulity towards science and experts; and a romanticisation of the natural world were thought to be important issues to consider with regard to people's responses to environmental risk. The Mass-Observation Archive at the University of Sussex provided an excellent data source in order to study people's reactions to nature in general, and hazards in particular. This source was used to explore whether the claims to postmodernity and uncertainty could be substantiated within western society and the possible implications this might have for hazard mitigation.

In particular, the research sought to consider the different ways in which people respond to natural phenomena and how the ideas raised by people might be translated into a culturally appropriate means to increase risk literacy. The research questions thus focused on a means to understanding how and why hazards are perceived in particular ways; whether cultural context means that practical approaches have to originate with the particular communities concerned to be effective; and how current approaches might be more successful in terms of ensuring information is both accessible and meaningful to the affected communities.

### Examples from Egyptian fieldwork

The examples relating to hazard perception given here are in relation to the 12 October 1992 Dahshūr earthquake (M 5.6) (Figure 1). Although the earthquake was relatively small in magnitude it resulted in a considerable amount of damage, for example 551 people were killed; almost 10,000 were injured; and approximately 7,000 houses were either damaged or destroyed (Degg 1993).

The fieldwork was conducted in five communities—Gerza, Barnasht, El Gama-leyya, central Cairo and El Kattamia (Figure 1)—affected by the 1992 earthquake. Questions were asked to gain an understanding of the interpretations that people have of this particular event. People were asked to discuss their general experiences as well as more specific issues. For example:

- Why did the earthquake occur here?
- Why was the damage so bad?
- Do you think that scientists will ever be able to predict earthquakes?
- Can people build houses that won't fall down in earthquakes?

These questions sought to establish some of the material issues and concerns that people had regarding the event (e.g. housing) as well as the more abstract ideas (e.g. the role of the scientist and the 'reason' for the event). By doing this it was conjectured that it might be possible to find an approach to mitigating the effects of disasters that people would be able to simultaneously accept and find useful but that would also be culturally sensitive.

### Examples of responses

It is inevitable in a society where religious literalism can, at times, be strongly manifest that ideas regarding extremes of nature are often going to be centred around other-worldly interpretations. As the main religion in Egypt is Sunni Islam, the Qur'an is the single most important factor in many people's lives (Akhtar 1990). Real world events can be interpreted as a manifestation of what is written in it and, indeed, the Qur'an has a surah entitled 'The Earthquake', linking this extreme event to Judgement Day. However, the association of environment with cosmology is not straightforward and there are many convoluted processes operating within the society that do not preclude the suggestion of other issues, as long as they can be interpreted within the religious discourses. Thus, science is an important and dominant discourse within Egyptian society, for example,

'Everything comes from God, only He can save our souls, *but* you can also explain earthquakes scientifically. After the big earthquake (October 12, 1992), I read a lot of geology to try and understand it. There are scientific controls on the environment and earthquakes and so on are natural events, but they are ultimately controlled by God. You can have science, but this comes from God' — *respondent from Cairo*.

Other responses to questions regarding earthquake prediction generated similar ideas about reconciling occurrence with Qur'anic text and religious belief:

'Yes, scientists will be able to predict earthquakes because of what it says in the Qur'an. It says that human beings are able to find something new everyday and therefore prediction is possible' — *respondent from Gerza*.

These are two clear responses that indicate the ways in which people reconcile other-worldly and this-worldly phenomena in order to derive an holistic understanding of the issues involved in

interpreting hazardous events. Many, however, are more sceptical of ideas that progress from science:

'The earthquake was related to God.

I heard that it is in the nature of the ground to crack and lead to earthquakes in the Faiyûm region, but I don't believe this myself'

— *respondent from El Kattamia*.

Since there are such a plethora of ideas regarding earthquake cause and prediction, it is fundamental to interpret, rather than attempt to ratify, people's actions. There may be significant reasons why people perceive things in certain ways, for example the possibility may be that people are reluctant to accept science and scientific explanations because they are denied access to them. This is a strong possibility in the case of gender divisions and access to educational structures within Egypt, for example, and it is argued here that as long as people are not given the opportunity to access what are, after all, amongst the dominant discourses within their society then they will remain disempowered. In this case, although one of these discourses is most certainly religion, others include science. Thus, it is the argument here that to deny people access to scientific knowledge, as has sometimes been the case with Third World mitigation projects, in the fear that it will violate local interpretations and ways of living is censoring at best and increasing marginalisation at worst. As such, it is suggested that science should be made available to people in a culturally sensitive way, i.e. couched in the terms of insiders as opposed to disguised in the context of outsider perspectives, in order that they at least have a choice. The possibility of raising risk literacy in this way is illustrated in the Egyptian Government's publication 'Earthquakes, Catastrophes and the Role of People in Facing Them' (Homan 1999).

### Fieldwork in the UK

The fieldwork in this case was conducted using autobiographical sources from the Mass-Observation Archive held at the University of Sussex, UK. This Archive was the culmination of work undertaken by a group of British surrealists, particularly Charles Madge and Humphrey Jennings, and by the 'self-styled' anthropologist Tom Harrison (MacClancy, 1995). It was begun in 1937 'to create, in their words, an 'anthropology of ourselves'—a study of everyday lives of ordinary people in Britain' (Mass-Observation Archive leaflet). The earliest material was collected in Bolton and London and involved

work done by investigators who recorded people's behaviour; and also work done by volunteers who kept diaries and responded to monthly questionnaires.

Contemporaneously, the programme has 1000 volunteers who are sent 'directives', asking a number of questions identified as significant in contemporary British life, three to four times a year by the Archive to which they write a response<sup>1</sup>. The directives<sup>2</sup> are:

'quite long and discursive, often disclosing a great deal about the author, and are designed to give people both guidance in helping them to write, and also the freedom to explore the subject in the way that best suits them...The emphasis is...on self-expression, candour and a willingness to tell a good story and be a vivid and conscientious social commentator as well as an open and thoughtful autobiographer' (Sheridan 1994)<sup>3</sup>.

Examples used here are drawn from two directives relating to nature and the environment more generally, and hazards and disasters in particular, in order to explore perceptions of the hazardous natural world. The first directive (autumn/winter 1987, Part II) is based on the 'hurricane' of 1987 that hit the south coast of England. The second directive used (summer 1992) was chosen because, although discussing nature more generally (as opposed to hazards and disasters), it raised many issues that were seen as pertinent such as the role of science and the supernatural in relation to the natural world.

### Examples of responses

The UK was used as a counter-example to that of Egypt as it is a society that is frequently held as having 'developed' and 'rational' approaches to hazards and disasters. The widespread, and perhaps sometimes indiscriminate, application of technology and science as means by which such events are mitigated is indicative of this. However, recent literature has suggested that the west now needs to be anthropologised, to 'show how exotic its construction of reality has been; empha-

#### Notes

1. The written response means that the Mass-Observers are termed 'correspondents'.
2. The use of the Directive is only one method adopted by the Mass-Observation Archive but is referred to here as the predominant research tool as this was the sole way in which the information for this paper was derived.
3. This is from a double-sided information sheet produced on the 1/9/94 by Dorothy Sheridan, the Mass-Observation project Director.

sise those domains most taken for granted as universal;...make them seem as historically peculiar as possible; show how their claims to truth are linked to social practices and have hence become effective forces in the social world' (Rabinow 1986 p. 241). Thus, it is also not possible to make taken-for-granted assumptions about the ways in which hazards will be perceived by the population. Instead, it is likely that the eclectic and 'messy' construction of reality is also evident within the UK.

Many people responding to the various directives referred to scientific approaches to the environment more generally and hazards and disasters more specifically. Some did so unproblematically, for example:

'We can only take the predictions and proposals [of modern science] seriously, because what other discipline can have as much knowledge about the world? (C1878, female, summer directive, 1992)

However, there were few unconditional endorsements of science as the best approach to follow, instead many people included a number of caveats with regard to the way in which science should be used. Dickens (1992a) who has looked at the material from the summer 1992 directive, has calculated that of the 408 who responded to this directive, 61% fell into this latter category. One example of this type of response is:

'I think their [scientists'] "explanations, proposals and predictions" should be respectfully considered, but scrutinised/ analysed in detail and at length and subject to very searching questioning and very reflective evaluation. Such experts, like all experts, should be 'on tap', but not 'on top' (S2137, male, summer directive, 1992).

However, there were also many other-worldly accounts of disaster cause, particularly in the light of the 'hurricane' of 16 October 1987, whereby people who have experienced disaster clearly felt the need to attribute some higher cause to the event. Indeed, Dickens (1992b p.169) maintains that in the event of disaster 'there is a strong sense in which people actively want to feel that something or someone else is in control of their destiny'. This is illustrated in the following example:

'Weather forecasters are mere mortals. The creation of big winds and the direction in which they blow is still to a degree in the hands of THE ALMIGHTY...

Perhaps when touching on the subject of weather...you would think that people would be reminded we are still mere specks of dust in relation to the events of the Universe' (G1951, male, autumn/ winter directive, 1987, Part II).

There are also those who have begun to tend towards more postmodern 'religious' understandings of the natural world, and disasters in particular. Many ascribe cause to nature per se as a spiritual entity or perhaps more 'New Age' type religions. This was illustrated by correspondents writing about associations with paganism, for example, or, in the case of the 1987 hurricane, by

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understanding hazards as a personified nature:

'Nature had gone mad, out of bounds—destructive, irresponsible, racing to its death, dragging everything with it. This was it. The end of the world was here—now, at this moment and nothing could stop it. Breaking glass, falling and breaking objects and the all-powerful noise that would not tolerate anything above it or mitigate it took over my brain...

All reason and life had stopped as we know it' (C1922, female, autumn/ winter directive, 1987, Part II)

People in the UK thus explain the hazardous natural world with a range of responses that could be described as incongruous and, in some cases, incompatible from a theoretical perspective. However, by using them all they produce a range of responses that are 'practically adequate'/meaningful.

### **Conclusions for disaster preparedness**

This brief exploration of hazard percep-

tion indicates that there is a range of responses to hazard and disaster which makes mitigation increasingly difficult. This is likely to be exacerbated in the future as forces of globalisation continually provide people with more diverse discourses with which to explain the natural world, for example the growing popularity of eastern religions in the west. As such it is important to take on board much of the literature pertaining to the changing role of the expert and begin to engage in a dialogue with people to find out the ways in which they understand the environment. That is, there needs to be a 'levelling' of the relationship between 'expert' and 'layperson' and the views of the latter need to be seen with a renewed validity. This has been developing as an approach within many projects in the Third World, for example through participatory appraisal techniques, but many of these ideas can also be extended to First World situations also. Indeed, it is only by doing this that risk literacy will increase and people will respond more effectively to hazard information.

The notion of a 'bottom-up' approach should be key with regard to all communities facing disaster or that live with the threat of natural hazards. It is essential that people are asked their perceptions and potential solutions to a situation in order that a mitigation project might be produced that is culturally sensitive, meaningful and workable in practice. It is increasingly the case that within disasters research these three issues are seen as inextricably linked as to neglect one aspect will potentially lead to failure of the project.

In addition to this, however, it is also important to use the cultural norms of the society in question to disseminate information regarding dominant discourses/ 'privileged knowledge'. As mentioned above, this was attempted by the Egyptian government following the 1992 earthquake through their publication of the book, 'Earthquakes, Catastrophes and the Role of People in Facing Them' which tried to reconcile scientific and religious discourses. This is clearly the central way in which people understand the environment and nature and so will have meaning/ practical adequacy for them. It thereby constitutes a mechanism whereby scientific explanations can be reconciled and made realistic for the people living in communities in Egypt. Furthermore, giving people access to dominant knowledge is to give them an opportunity to take a critical stance towards disaster 'propaganda' and hyperbolic accounts.

The situation in the UK is dictated by its own peculiar characteristics and thus requires a different approach. Here, for many, the scientific culture has lost tenacity and relevance and perhaps one of the approaches is to bolster *critical science*. One way to do this is for people to see science as a method, rather than a body of truth, and also as something which can be fallible, thereby avoiding the feeling of being let down that many people have when scientists do not manage to predict events with pinpoint accuracy.

However, the responses from the UK also indicate that perhaps other ways of looking at the world also need to be considered in order to effectively communicate the message about hazards and disaster. It is certainly important to accept that numerous explanations exist with regard to people's understandings of hazards, reiterating further the need for dialogic research processes.

The answer is thus to remain flexible to the ideas that are present within societies and to respond in such a way as to be mindful of the social constructions of nature and the environment that are present within them. The eclectic nature of society and the diversity that exists within any one tradition means that a broad-brush approach to hazards is erroneous and dangerous.

Instead, the subtleties of society must be taken on board and the community should be involved more in decision-making processes rather than less. In addition, mitigation strategies should be based on the notion of opportunity rather than enforcement. Projects need to be designed whereby people have access to meaningful knowledge, derived from negotiations through the more horizontal, 'level' relationship with 'experts'/'researchers'.

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**This article has been refereed**

# Aircraft accident emergency planning and emergency management

## Introduction

Many lessons are being learned through investigation of incidents around the world — the subject of this paper is the need for thorough planning of responses to aircraft emergencies to ensure that casualties and property damage are minimised. Investigation of major accidents and some serious incidents in various parts of the world has shown the value of being prepared for the type of event that everyone hopes will never occur.

With the inclusion of investigation of serious incidents in ICAO Annex 13 in 1994, many states have incorporated the requirement for such investigations into their national legislation. Others now investigate incidents and serious incidents without any legislative basis, whilst others choose to continue investigating accidents only, primarily because of limited resources, skills, expertise and finance.

The economic and social effects of emergencies and accidents, including loss of life, destruction of property and dislocation of communities, cannot be overstated. Emergency planning is the key to minimising the harmful effects of such events. Around the world, experience has shown that communities and organisations that have effectively applied a comprehensive emergency planning process are better able to cope with the impact of adverse events.

Emergency planning may also help protect organisations from litigation arising out of 'duty of care' provisions in common law. The general obligation of fulfilling duty of care, and the specific requirements under local state/territory legislation, indicate clearly the need for communities and organisations to develop, test, and review emergency plans. Only by carrying out a stringent planning process can the lessons of past investigations be learned.

A vital point in discussing emergency response planning is that aircraft accidents can occur anywhere, not just at departure and arrival airfields. Hence, planning for such mishaps should be on a national scale, although much of this planning will be focused on airport emergency responses. Because of the

by Lindsay Naylor.

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diversity of planning needs, this paper will concentrate largely on planning undertaken by airlines, and airports and the local surrounds.

This paper examines these emergency planning processes, drawing on the experiences of past accident and incident investigations. These experiences show that failure to heed the results of investigations can lead to 'history repeating itself' in later events, perhaps following a major accident in which lives are lost because of poor planning. Ultimately, the aim of comprehensive emergency response planning is to minimise pain and suffering of all associated with an emergency event.

The paper also addresses ICAO Annex 13 provisions relating to investigation of the effectiveness of an emergency response in an accident or incident, raising the question of whether existing requirements are sufficiently stringent.

## Emergency response planning

Professor James Reason of Manchester University has carried out considerable research and has published a great amount of material on 'Organisational Accidents'. Reason's (1997) work on latent and active failures and in-depth defences and the dangers of neglecting or forgetting the effects of things that rarely happen, is just as valid in response planning and operations as it is to the production and transport organisations featuring in his studies.

For example, Reason has offered the thought that when an organisation operates for a lengthy period without experiencing an accident or serious incident, a mindset develops in the organisation that less effort need be devoted to safety considerations. In this situation, safety is eroded as productive

demands gain the upper hand. As a result, investment in safety measures declines, more capital is devoted to productive growth and the whole operation becomes less safe. The consequence is an increased risk of catastrophe. The corollary of this line of thinking is a similar effect in an organisation's response preparations. In short, 'We have a safe operation, we have not experienced an accident for years; why should we spend time and effort on preparing for the effects of an accident? We would be better off investing more money in additional equipment that is going to generate income.'

Airline safety managers and airport operators need to guard against such thoughts to ensure that their response preparations do not suffer. They need to promote the value and wisdom of preparing for the unexpected. Devoting scarce resources and spending money on preparations for responding to an accident may appear difficult to justify, but an old adage applies. 'If you think spending money on safety and preparing for an accident is wasteful, try having an accident when you haven't done any preparations.'

Reason's (1997) studies have included high-reliability organisations as targets — systems or companies having less than their 'fair share' of accidents. He found that people who operate and manage these organisations do so on the premise that 'every day will be a bad day', and prepare for the consequences of a 'bad day' accordingly. This attitude can be very difficult to sustain, particularly in time of economic pressure, and managers need to resist any temptation for complacency. It is the company that continues to operate in this way, considering and preparing for adverse events, that is less likely to experience a serious accident. Nevertheless, if it should meet with such a misfortune, it will invariably be prepared for that day.

Airport and airline planning committees and senior executives should consider very carefully all aspects of the scope and size of the emergency planning project. The temptation to 'cut corners', firstly to promote or accept an abbreviated planning process, or secondly, to try to

operate with less than optimum numbers during a response, needs to be resisted. The basic premise in both the planning process and the emergency response, should be to ensure that adequate resources are committed. In practice, this usually means initially committing too many resources rather than too few. The task can be scaled down if necessary. Another prudent consideration is to utilise the range of staff expertise at all levels. Only through harnessing this collective experience of staff members can a successful response plan be formulated.

The importance of a comprehensive consultative process in producing response plans has been stressed. This consultative process needs to extend into the community surrounding the airport and to local government agencies, as the effects of a major disturbance on an airport, or on a community in the vicinity of an aircraft accident will be significant. Clearly, airlines and airport response authorities cannot be expected to consult with every community under aircraft flight paths, but they do need to discuss the potential effects of an aircraft accident on communities short distances from an airport and with authorities that could be expected to respond to accidents remote from normal operating centres.

Of particular importance will be the reaction of the public living near the approach and departure ends of the runways. These people have understandable concerns that an aircraft accident may affect their personal safety and their property. A firm relationship based on mutual understanding and built up by involving the local community in exercises and de-briefings will allow residents to appreciate the safety concerns of the airline, airport and the airport community. Also, as members of the local community, they value being part of the wider planning and decision making process.

As in all undertakings of this kind, budget provision needs to be made for the staffing, resources and training of staff in the operation of the response plan, and this should be set in consultation with senior company management. With regard to an actual emergency requiring activation of local response plans and Airport and Airline Emergency Response Plans, there should be a designated budget within each authority that is immediately accessible, and on which immediate draw down can take place. Full reconciliation at the conclusion of the emergency should satisfy company accountants.

There are many 'services' that are

required to respond to an accident on or in the vicinity of an airport, such as fire, police, medical, welfare, and local government agencies, as well as national departments and agencies such as customs, agriculture and health. Each of these services will raise its own supporting response plan for the airport and will also exercise these plans regularly. The exercises may or may not involve the airport and other authorities, and are sometimes held in isolation. However, as a general rule, there are national and international requirements (eg ICAO, IATA) for 'full scale' exercises involving all elements of the internal international airport residents and responding agencies to be held on a fixed time scale.

In consideration of the differing response plans affecting an airport, one factor needs to be clearly kept in mind. That is, no matter which service or agency raises a response plan, the plan should not be produced in isolation. An integrated, systemic approach is essential. There needs to be full recognition given to the fact that the aim of an emergency response plan is to lessen the adverse effects of the emergency on the community and/or unfortunate organisation. This can only be achieved through the cooperation of all responding services and regular meetings of the various elements to rationalise their individual responsibilities, and to practise the command, control, coordination and communications necessary to arrive at a positive outcome to the emergency. Thus, an airline needs to be prepared to contribute to this local planning process if overall optimum emergency response plans are to be produced. The result will be a more efficient response to an emergency.

Composition of an airport response plan is flexible, but should include:

- an aim or objective, the scope of the plan, and authority for its issue
- joint management arrangements, e.g. organisational responsibilities, members of airport emergency planning committees
- emergency response facilities/centres and their likely locations
- operational response details, including airport access and emergency response requirements
- activation of plan
- welfare of staff involved in response and counselling arrangements
- recovery operations and management
- details of supporting plans, e.g. Care of Relatives Plan, Media Handling Plan, Terminal Evacuation Plan etc.
- arrangements for training exercises

and testing the response plan.

In joint response operations in some parts of the world, perennial areas of uncertainty are the arrangements specified relating to command, control, and coordination arrangements. The reason for uncertainty (and sometimes inter-agency conflict) is a general lack of understanding of what the terms mean, because although the elements for successful resolution of any accident are graphic in their simplicity, they can be complex in their execution. On occasions, this has led to the response operation being hindered.

An essential part of the emergency planning process is to ensure that there is no doubt or ambiguity as to all aspects of command, control, and coordination of all aspects of the operation. Indeed, regular exercising of these elements with all agencies that may be involved is equally important. Agencies include those internal to the airline or organisation, those outside the immediate sphere of that airline and, more particularly, those that will involve the local community.

Different countries may utilise differing interpretations of what is meant by command, control and coordination, but following are explanations that have a general acceptance.

### **Command**

Command can only be exercised over staff in one's own organisation. It is the commitment and direction of resources by an officer of that organisation. To avoid any confusion, and in quiet times well before the event, management of many of the aspects relating to the aftermath of an accident needs to be considered by responsible members of the organisation. A clear path of action outlining these arrangements should be followed, so that management and subordinate staff will not be confused by any contention that a member of one organisation has 'command' over an employee of another organisation during the response. As an example, a Police officer may be the overall 'Incident Controller', and he/she may be empowered to direct senior representatives from other services to carry out certain tasks, but 'command' of personnel always remains with an officer of that organisation. Simply put, command is exercised vertically within a service, never across services.

### **Control**

Control relates to the situation itself. It is the broad direction or control of a response operation as described immediately above. For adequate control flexibility, there needs to exist the ability



to vary existing plans that are already in being, and to formulate new criteria and action paths as the accident scenario unfolds. Control involves using all agencies to reduce the effect of the accident, and can require certain specific actions from other agencies. An overall Incident Controller (usually a police officer) will normally be specified in response plans. However, until an accident site has been declared 'safe', a Fire Service officer will usually retain site control. Control is closely related to coordination.

### Coordination

Coordination also relates to bringing together all those resources, particularly those that are readily available or procurable and considered necessary to handle those ongoing phases of the accident. The coordination role is usually the responsibility of a controlling authority as designated in the emergency response plan, and will involve close liaison to identify how resources can best be provided. An important part of the planning process is to determine areas that will provide staff quickly and possibly be prepared to work with shorter numbers until the immediate effects of the event have passed. Equipment-oriented resources can cover a wider range of logistics. For example, there could be a requirement for providing or obtaining the plant and machinery necessary to continue rescue, salvage and clean up operations. Whatever the resource, coordination is required to make appropriate local, national and international decisions, and therefore bring about a successful conclusion to the operation. Controllers will certainly require passenger and cargo details very quickly. (Note that provision of detailed passenger and crew manifests and details of cargo carried should not present a problem because these details are available to airline liaison officers, but experience has shown that gaining this information can indeed take time).

Although this paper focuses on airport and airline emergency planning, the emergency planning process and the requirement to have a proven Emergency Response Plan in place are not the exclusive provinces of the aviation industry. There are many other segments of the workplace that benefit through a comprehensive planning process. Most large organisations now adopt this process (at least to some extent) to fulfil their legal obligations and to make the workplace a safer environment for their employees. According to media reports, a notable exception was the Japanese

nuclear plant that experienced a significant accident in September 1999. There appears to have been no emergency plan in existence for the plant and the company has faced massive legal/compensation damages and senior dismissals/resignations. There is little doubt that any industry that operates in a potentially hostile environment, would benefit by having in place a prepared emergency response plan. One of the functions of such a plan is to lessen the impact on legal and financial aspects of the organisation in times of stress.

### Investigation of emergency responses

Any responsible authority charged with responding to a particular facet of an aircraft emergency will carry out a comprehensive investigation of the effectiveness of its part in a response operation. Similarly, authorities responsible for the overall coordination of a response will complete a detailed study of the whole operation. These investigations (albeit sometimes in the form of a relatively short discussion or debrief) are usually carried out after any activation of an emergency plan for an operational or training response. Thus, provided these authorities are prepared to learn, and implement appropriate change when necessary, emergency response plans should remain adequate.

While this process ensures ongoing internal scrutiny of emergency response plans, it sometimes lacks the necessary objectivity and independent focus such as that generated by an ICAO Annex 13 investigation. Clearly, the investigating authority of a state is best-placed to ensure that an impartial analysis of all aspects surrounding an aircraft safety occurrence is completed. This is the object of an aircraft accident or incident investigation—to gather and analyse information, to draw conclusions, and to make safety recommendations to assist in accident prevention. Ultimately, the investigation should minimise future casualties.

The provisions of Annex 13 are directed primarily at an investigation contributing to prevention of accidents and incidents. This is clearly stated in Chapter 3. The focus is not on the aftermath, the emergency response, although this can certainly affect the ultimate outcome of the event. Regrettably however, investigations of incidents do not always result in an accident being prevented, so some effort needs to be devoted to determining the effectiveness of a response.

Annex 13 does not preclude an investigation delving into a response, but the provisions are not specific. For example, the 'Survival Aspects' section of an investigation report requires 'brief description of search, evacuation and rescue, location of crew and passengers' etc. Annex 13 does not require any specific comment on the coordination of the response, although survival issues which may depend on relevant emergency response plans, would probably be investigated in depth. (In cases such as the El Al accident in Amsterdam, emergency response plans for the various city emergency services would have been outside the scope of the accident investigation, but would probably have been the subject of a separate, independent investigation.)

Further, in examining 'Organisational and Management Information', an investigator is required to examine various organisations 'influencing operation of the aircraft'. An emergency response does not fall readily into this category, as it is only required when there is already a problem with 'operation of the aircraft'.

Perhaps the area that provides the best opportunity to include an investigation of the response is the 'catch-all' section titled 'Additional Information', which provides an investigator with the discretion to investigate anything he/she chooses. However, in an incident investigation, or a less serious accident investigation, the effectiveness of the response may not spring to mind as warranting any study. In such cases, there is no external investigation of this facet of the incident or accident.

Considering that a well coordinated emergency response may be vital in saving lives, there may well be a case for a slight expansion of Annex 13, to provide more guidance to investigators in examining emergency responses both in accident and incident investigations.

### Emergency response structure

Regardless of the frequency of use of an airport, or the likelihood of large aircraft accidents, all airport authorities should include emergency response structures as part of the agreed emergency response plan. Some parts of an airport's emergency planning structure may never be used, but trying to respond to an accident that is beyond the scope of a response authority's expectations if prior deliberations and planning have not taken place, is a recipe for disaster.

Thus, small or large airports should consider joint emergency response agencies to cater for the whole range of

possible responses. A small country airport without scheduled passenger jet services could find itself being used as a diversion airport for a large aircraft of a major carrier experiencing an emergency. This sort of event at least needs to have been addressed in emergency planning, and the emergency response plan should have identified the type of structure likely to be needed to react to such an event. An important point is that, in effect, an airport authority needs to carry out a risk management study as part of the emergency planning process.

If any central planning document exists, reference to it makes emergency planning a simpler task. In Australia, a document titled 'Airport Emergency Planning in Australia' which has been agreed by a central planning committee, sets out a plan framework, providing airport emergency planners with appropriate guidance.

Following paragraphs describe a typical airport emergency response structure to cope with most emergencies. The intention is not to provide an exhaustive list, but to provide guidance as to the type of agency that might be utilised.

The hub for the response is an Emergency Coordination Centre. As the name implies, it is the coordinating centre for all types of support. It also has the responsibility to liaise with other external agencies on progress of the response. Various other agencies (e.g. the affected airline) are inter-linked with an emergency coordination centre.

When an accident occurs, a Forward Command Post is necessary close to the site. The Incident Controller and agency commanders would be located there. Immediate rescue and fire fighting operations are directed from the Forward Command Post.

In a designated terminal, a Terminal Command Post manages the response to the 'terminal emergency'. This usually means the crowd control problems of visitors to the terminal, and the matching process of passengers and those who have come to greet or farewell them (loosely called 'meeters and greeters'). To assist in that process, separate centres for passenger reception, relatives (or meeters and greeters) reception, and recovery matching will be necessary. These centres are pivotal to an airport's ability to reunite survivors with loved ones quickly, to clear terminal congestion, and to assist the affected airline with its recovery.

Lastly, a specially formed Media Centre will be essential in order to coordinate and focus interaction with the media, and

provide accurate information to the assembled press. The media needs to be provided with accurate information at frequent intervals, but clearly specified and controlled (e.g. through scheduled press briefings), or the airport (and airline) risks having speculative material broadcast and published.

These agencies need to be linked with appropriate communication technology which should be tested at regular intervals, or there is a major risk of coordination problems when the fateful day of an accident arrives. Communication security should also be a consideration, and if necessary, provision will need to be made for (say) encrypted message traffic.

### **Stress and the need for counselling**

A point not understood by many who have not experienced catastrophic situations, is that even the most stoic of persons can suffer serious adverse effects from grief and trauma. These people can 'put on a brave face' at the time and may not appear to have been affected to any great extent, but many years later, the effects can manifest themselves. At this time, these previously 'unaffected' persons can suffer major breakdowns. Fatal aircraft accidents are typically the sorts of event that can result in this delayed effect.

Attempting to predict the situation that could bring about this effect is not possible. There are too many variables and too many different personalities. Those affected can involve the complete range from hardened firefighters to airline junior 'check-in' staff. There does not have to be a physical contact with the scene of the operation, nor the viewing of the painful sights to be seen around an accident site to incur trauma. While those involved in such activities may well suffer mental distress and demonstrate a need for counselling, many others who may have been employed remotely from the accident will need assistance.

Those airline personnel who have to deal with emotional relatives and friends; those who have to handle the identification and disposal details of the deceased; those 'who did not join for this' and are now involved; will all suffer from stress to some degree. All will become victims and survivors themselves. They also will deserve care and attention and a responsible airline, airport, or responding authority or agency will need to ensure that they attend to such personal counselling. As an example, Air New Zealand's DC-10 accident on Mt Erebus in Antarctica in 1979 resulted in a major counselling

program for victims' relatives, and this grew to include airline staff who were affected by the tragedy.

Consideration should also be given to conducting a debrief of all staff. There is value for each operating department to hold an internal debrief to ensure that the organisation's plan(s) was followed and was relevant. Possible amendments and enhancements to the plan should also be discussed in this session.

Further, staff members should be provided with the facts of an accident as soon as they can be promulgated, taking into account the matter of potential legal proceedings. This could take the form of an airport or airline de-brief, and gives all personnel an appreciation of the facts and a feeling of 'belonging' to a caring organisation.

Airlines in particular benefit from this process, the point being that an informed staff member is, in effect, a character witness for the airline. Thus, every effort should be made to make staff aware of the circumstances and the ongoing progress of the accident investigation process. A small amount of time keeping staff members informed can be a valuable investment in the future of the airline. However airlines and responding agencies need to ensure that only authorised staff divulge information to the media or public.

Airline emergency response plans should always include a comprehensive section on counselling. In all large scale traumatic events, established emergency procedures need to be in place to provide suitable counselling to all who may have been affected. The list includes passengers and crew, relatives of deceased personnel and staff involved.

Airport operators and other responding rescue and welfare agencies should all have in place access to appropriate counselling services within their own response plans. As events unfold, affected personnel may wish to utilise the services of another agency's counselling service, particularly if they have operated alongside members of that agency during stressful periods. (In Australia many personnel elect, by invitation, to attend police debriefs and to utilise police counselling services.) This decision should always be left to individual choice. However, regardless of counselling services available externally, all agencies should be capable of catering for the needs of their own staff.

The need for counselling will vary from organisation to organisation and indeed from situation to situation. Many large



companies that have a separate welfare and counselling plan, look to providing suitably trained and rostered staff to be attached to a particular passenger in the ratio of two staff per surname. This attachment, provision of counselling and airline assistance may continue for a number of years.

To minimise the traumatic effects of a disaster on company personnel there should be no embellishment of the event to staff but simple and proven facts given. Counselling should be made available from the outset. The stress experienced by on-site response and investigation teams is self-evident, but equally important is that a watch should be kept on staff in other areas. For example, staff who have contact with the public will be subject to a range of pressures and stresses and managers will need to ensure that operating personnel are not suffering adverse effects.

There should be provisions made to bring in more staff to augment those engaged in the ongoing handling of the accident 'administration' as well as operational procedures and a need to provide relief and rest facilities near the workplace. Transport to and from work should also be considered. As always, provision of a surplus of staff rather than insufficient numbers is the preferred solution, downsizing later if required. Attempting to expand the operation is always difficult and will increase the stressful working environment for those on duty, increasing the likelihood of staff members requiring counselling and time away from the workplace.

### **Emergency response training**

The raising and provision of an appropriate response plan is only the first step in an ongoing process to ensure that the agreed requirements to mitigate the effects of an accident are achieved. To ensure that the plan is meeting the response objectives as required both by the airline and by airport and response authorities, there is a need to regularly review the Plan and carry out training with staff involved. This training also ensures that airline plans remain in harmony with those of external agencies. Relevant laws and regulations (international and national considerations) will change occasionally, so these also need to be considered in reviewing and exercising plans. This process will ensure that airline plans conform to the highest standard.

Unfortunately, some managers like to consider themselves exempt from the need to undergo emergency response

training. However, senior staff need to exercise their roles as much as anyone in the organisation and responsible executives will willingly participate. Training also needs to be given to the management in activating and operating the plan on behalf of the company, with the training automatically flowing to all those who have an active role in the operation of airline response plans. Once training has been given there is a need to ensure that it is reinforced with regular and appropriate exercises.

The frequency and scope of the exercising of various components of the plan is essential. Management's aim should be frequent, low cost exercising of portions of the plan, such as activation and communications. Exercises can be 'table top' where selected management personnel run a simulation of an accident and can vary in size and complexity. They may involve actual deployment of resources, be simple or complex as the planning committee desires, or can be full-scale field activities, either held 'in house' or in conjunction with an outside agency or airport authorities.

International obligations specified in ICAO Annex 13 require a full-scale exercise involving the equivalent of the largest aircraft to service that airport, to be conducted every two years. If the airport is near hostile terrain, the exercise should involve sub exercises that will require response agencies to demonstrate proficiency in operating in that terrain.

With international operating standards prescribing full-scale field exercises at licensed airports at least biennially, participation in exercises of this nature may satisfy airline requirements. Conversely, airline management may deem that more is needed from an exercise than the all-embracing field exercises can provide. On many occasions, such exercises touch on airline reactions only superficially. Therefore, airlines need to consider programming additional specific purpose exercises, such as the previously described table top exercises, to ensure that all areas of the company are well-prepared.

Selection of an appropriate facilitator is vital to the success of a table top exercise. The facilitator is responsible for ensuring that the exercise flows smoothly and needs to be familiar with emergency response processes to explain areas that may not be clear to all participants. He/she also needs to be comfortable in leading discussions in front of an audience comprising representatives of a range of organisations.

Any response plan that has been developed by an airline operating over a network needs to be regularly exercised not only in conjunction with the local authorities (although this can be a good starting point), but also with local airports and agencies. Careful planning of these exercises is needed to ensure that they meet their primary goals and not become vehicles for local political points scoring.

Training exercises may be randomly timed, or they may be a set piece with staff aware of the time of commencement and ending of such an event. The table top exercise lends itself to the latter, more regulated timings. Selected observers should be detailed to attend exercises, primarily to critique the airline's efforts in relation to its formulated response plan, but also to pass similar thoughts on the performance of other participants. The aim is always to enhance an airline's and local response capabilities, and this can only be achieved through constructive comment.

Table top exercises offer the advantage of bringing all response agencies (including hospitals, local government etc) together at relatively low cost, in a closed environment to work through a scenario. Thus, all involved maintain an awareness of how their roles fit with other response agencies. Too often in the past, some response agencies have given the impression that they would prefer to operate independently. However, the results of incident investigations have confirmed that no one can hope to operate in a vacuum if a response is to be successful. Appropriate education and training of all concerned is vital.

Programming of training exercises should consider actual experiences in responding to actual emergencies. Any emergency that results in activation of an Airport or Airline Emergency Response Plan (from any sector of the airline, airport or allied agency) can be regarded as a training opportunity. When the emergency has ended, such an event should be the subject of a full debrief, with attendance by appropriate staff members.

### **Emergency planning in Australasia**

By international standards, Australia is fortunate to have so far avoided the large-scale responses that have been necessary in some countries. However, Australia recognises that its good safety records are somewhat fortuitous and takes steps to guard against complacency.

As with the provision in many parts of the world, there is a general requirement for all Australian states and territories to

produce emergency response plans. These embrace policy and procedures for responding to all types of disaster, and include airport emergency plans as essential ingredients. Vital to this planning process is the role of local government, which is pivotal in ensuring that preparations are appropriate, although in general airport operators around the country have embraced the need enthusiastically.

In some countries, broad-based National Disaster Plans are produced to cover all known adverse phenomena that may have an impact on the country as a whole, with serious consequences to the economic and social structure of the state and the community. There will be contingency plans in being with a section devoted to acquisition of transport to cater for the emergency, whether it be weather related, geological or industrial in origin, or even war or acts of violence. Designated international flag carriers, as well as internal and domestic airlines will be identified as transport providers, and expected to make their aircraft and crews available to the national government on demand.

Australian States and Territories have developed their own disaster and emergency plans that support the national plans. In the same vein, local planning processes ensure that plans produced complement state/territory and national plans. It is important for airlines to be part of the national planning team and to take part in the decision making process, factoring into their own response plans the likelihood that their aircraft and manpower resources may be acquired by the particular State or Territory in time of national crisis. Once the national plan has been evolved, the airlines' own planning documents should reflect agreed courses of action and levels of participation in the national calamity.

Again, by law, every licensed airport owner in Australia is required to publish an airport emergency response plan, and to exercise those plans regularly. The rationale for compulsion is because the economic and social effects of any major aviation disaster will involve damage to property, at best a disruption to the local airport community and the surrounding environs, serious injury, and the possibility of loss of life. Each of these elements will require special and specific needs to bring about a restoration to some kind of normalcy to the affected organisations and areas. Coping with the problems generated in an emergency requires recognition of specific arrangements and procedures that will be required to manage the emergency,

and gives a reason for pre-accident focus and planning. These special arrangements and procedures should be derived from the planning process and reflected in a written document, an agreed emergency response plan.

Several years ago, the then Australian Civil Aviation Authority published guidance to airport operators on how emergency response plans should be developed. Although this guidance included a detailed listing of planning considerations, it was grasped with varying degrees of enthusiasm by operators. The National Airport Emergency Planning Committee (NAEPC) is a vehicle for airport operators and airlines to participate in a national planning process, and adds emphasis to the need for comprehensive planning processes around the country.

Almost from its inception, the NAEPC was chaired and managed by the Federal Airports Corporation (FAC). However, with the demise of the FAC, there was concern amongst airport and airline emergency planners that the work of the NAEPC may have been impeded. However, to the credit of all concerned, the committee has continued to function effectively and airlines and airports still enjoy the central planning process to assist in maintaining effective response plans around the country. The NAEPC (among other things) is responsible for the production of 'Airport Emergency Planning in Australia', the planning document mentioned in an earlier section.

For sceptics who would cite Australia's good safety record as justification for minimising time and money spent on emergency preparations, they should reflect on years gone by when Australian airlines did not enjoy such good fortune. For example, some 50 years ago, Australian National Airways experienced four major accidents (hull losses) in a period of about three months. The airline did not collapse, but was taken over by a competitor within a short time. Even considering that aviation is now far safer than during the 1950s, accidents at (say) Sioux City and Amsterdam show that events requiring a major response from local authorities can happen at any time, even in a safe industry.

A fundamental point in gaining acceptance and cooperation from all concerned is that in developing this type of plan, airlines need to put their normal competitive spirit aside and involve rival airlines in the response planning process. In Australia the major airlines have shown that they are willing to undertake this type

of mutual cooperation. In the very busy period shortly after an accident when an airline will rarely have sufficient staff available to carry out the increased range of duties, respective managements may agree that staff from a competing airline could be used to assist it through the difficult period. The types of service provided in this way would probably be limited to essential, short-term requirements, and is a means of maintaining the collective safety health of the airline industry.

These procedures are adopted in many countries with similar responsibilities being accepted. However, the organisational titles and legislative responsibilities vary from country to country so airlines in particular need to be aware of differences in states into which they operate or overfly.

As an example, under New Zealand law, responsibility for national disaster management is vested in its Civil Defence organisation. Airports are required to have a Response Plan, but unlike Australia, there is no central, designated planning committee. The New Zealand Civil Defence Organisation deals with all disasters including airports and major aircraft accidents and exercises are carried out regularly for all types of emergencies.

Universities in various part of the world have been specialising in advanced aviation studies for some years. These courses include a range of subjects related to most facets of aviation, but only in relatively recent times has the scope of the courses been expanded to include emergency responses.

In Australia and New Zealand several universities and technical institutions include such emergency planning modules in their expanding aviation undergraduate courses, so awareness of appropriate emergency preparations is growing amongst those who can be expected to hold future executive positions in the industry. Aviation safety professionals are engaged to deliver these programs ensuring that students are provided with the benefits of practical experience to complement theoretical information.

As in one or two other countries Australian university students are encouraged to join their local society (or chapter of ISASI) so that they can receive a very early foundation in all aspects of air safety. The Australian Society of Air Safety Investigators reinforces this encouragement by having an annual student award for the best paper by a student on a relevant subject.

## Conclusion

Clearly, an accident is an unplanned or unscheduled event, or is the end result of a combination of events and circumstances which usually produces unintended suffering, injury, death or property damage. Those who are involved in the operation of an airport or airline always need to be on their guard to lessen the effect of such a calamity on their customers, the public, their organisation, and just as importantly, themselves and their staff.

The problems that need to be considered and resolved by an organisation commence at the time of the impact and may continue for many years. There is only one proven way to combat the effects of the event: a well formulated and accepted company Emergency Response Plan supported by strong leadership.

The heart of this plan or any set of procedures, is a quick and accurate response to a given set of circumstances, produced by pre-planning and demonstrated by exercise and practice. However, just as management of an airline's operations is by human beings, management of an accident and its aftermath is by people and is therefore subject to human frailties. The complexity and sophistication of the equipment used by an airline are unimportant unless the individual is prepared to deal with the unexpected, the system failure. That is the key to successful emergency response planning, planning for the unexpected, and definitely the unwanted.

The catchwords to successful mitigation of any accident aftermath are still command, control and coordination. Nevertheless, we should still bear in mind the thought that carefully planned training and the prudent (and sometimes reluctant) allocation of resources for that training are strong factors in the minds of management. However, if sufficient finance and resources are not committed to the planning, training, and exercising processes, the organisation will risk a less than optimum response, loss of company image and perhaps bankruptcy.

In some countries, incidents and serious incidents were being investigated long before ICAO formalised the requirement in 1994. However, even now, many investigations are not required to address the success (or otherwise) of the emergency response, and whether it was effective in reducing casualties. Indeed, Annex 13 requires only a 'brief description' of the rescue operation etc., so in an investigation of an 'incident', this may not be mentioned at all.

Incident investigations are invaluable

in assisting relevant authorities, companies etc. to reduce the likelihood of an accident, or to minimise casualties in the event of an accident occurring. For example, an awareness of how an airport authority may have reacted to an aircraft emergency would certainly assist in reviews of emergency plans. However, the investigation of an incident (or an accident) first needs to focus in some detail on the broader aspects of the response, with appropriate recommendations to enhance response measures.

Finally, to learn from incident investigations requires those in authority to be prepared to change, and this can be difficult to achieve. However, failure to heed the results of investigations will invariably lead to 'safety stagnation';

nothing will change, lessons will not be learned, incidents will lead to accidents and increased numbers of casualties.

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# Conference Announcement

## The Future of Emergency Management

Saturday 24th November, 2001

At the MFESB Training College, 619 Victoria Street, Abbotsford

Again this, our 23rd Seminar, will be a One-day presentation. We have selected the theme *The Future of Emergency Management* this being of major importance to each of the various Emergency Services, support Agencies, Municipalities and corporate sector. Speakers will present various aspects of the theme and, as always, we are targeting 'hands on' people and planners.

The Seminar will be opened by the Minister for Police and Emergency Services Hon. Andre Haermeyer MLA and Victoria's new Chief Commissioner of Police Ms Christine Nixon will deliver the keynote address.

Among the papers to be presented are

- Emergency Risk Management.
- What role will volunteers play in the future?
- Chemical, Biological and Radiological Training.
- Health risks faced by emergency personnel
- DNA profiling, as part of DVI.
- Overseas exchanges — the Timor experience
- Recovery from Emergency

Unfortunately, due to the change of venue, the seminar is limited to the first 200 attendees so book early and avoid disappointment. Further details will be circulated when finalised.

**Mark your diary now - Saturday November 24th 2001.**

For more information contact:

Mr. Mark O'Connor

The Registrar, P.O. Box 52, Briar Hill, Victoria, 3088 (Enclose S.S.A.E)

Phone: (AH) 03 9432 5300 Fax: 03 9432 3656 Email: cessi@omega.au.com

Or you can register on the website at: [www.cess.au.com](http://www.cess.au.com)

# Emergency exercise and training techniques

## Introduction

An emergency plan is not a viable document without an exercise and training program to support it. Even with the best laid plan, only its effective implementation by the people involved will rescue and care for the victims of an emergency.

Emergency services and company staff must be educated through briefings, walkarounds and exercises. Familiarisation with the geography of local surrounds and facilities is important for emergency services whose core role is emergency response but who may not be familiar with the complexity of a particular environment such as an airport. Conversely, company staff will be experts in their surrounds but may need education with regard to emergency response and recovery arrangements.

It is essential that all training involves multi-agency participation, ensuring that potential responders partake in problem solving exercises and become familiar with their roles. Exercising and training should be kept interesting and cover all probable emergency situations.

This paper is designed to explain some of the different types and methods of emergency exercise and training and will also outline what an Exercise Planning Group needs to consider during the preparation of an exercise. Some examples

by Sarah Renner,  
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specific to the airport environment are used throughout, however the guidelines could be applied to almost any industry.

## Types of exercises

The types of exercises can take different forms, extending from information sessions to full field exercises. A planning group's aims and objectives will form one of the following types of exercises:

- information session
- walkaround
- tabletop exercise
- centre simulation
- field exercise

For each of the training sessions or exercises, a facilitator, presenter, guide or management group is required to ensure that pre-determined training and exercise objectives are met.

## Information sessions

A planned information session is an easy way to train and impart information and ideas to a varied or specific audience. The exercise involves a presenter or guest speakers and an audience. In this forum the presenter imparts information to the

audience and there is little opportunity for interaction, as depicted in *figure 2*.

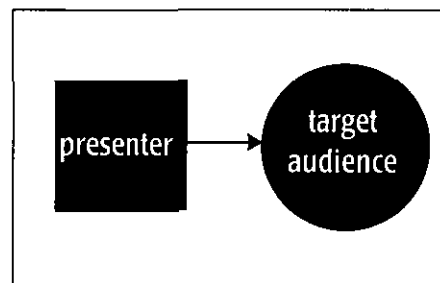


Figure2: Information session exercise concept

Sessions such as these will also allow a greater number of interested agencies to become involved and are a perfect opportunity to introduce staff to the plan.

Examples of types of information sessions are:

- simple briefings, familiarising staff and companies with the emergency plan and informing them of their responsibilities
  - companies and emergency agencies can allow an insight into the way they operate internally, thereby giving a broader understanding of company standard operating procedures and potential restrictions within a company's authority
  - a forum where guest speakers, professionals in their field, are able to inform attendees of particular aspects of an emergency situation such as 'an aircraft crash investigation', 'the perspective from an aircraft manufacturer', or 'the content of a disabled aircraft removal kit'
  - an opportunity for responders or victims who have experienced an emergency to speak to emergency response and recovery planners
  - experts abreast of emergency planning human factors, technology, response etc. can update emergency planners on improved techniques and best practice
- The advantages of hosting an information session are:
- it is relatively simple to organise
  - a fixed venue can be used (a good idea would be the use of an emergency centre facility)



Figure 1: Exercising and training should be kept interesting and cover all probable emergency situations.

- it is a good training forum for introducing staff to the plan
  - it allows opportunity for emergency planners to further their knowledge
- The disadvantages of hosting an information session are:
- it allows for little liaison and interaction between attendees
  - strengths and weaknesses of the plan or the participants cannot be gauged
  - it allows for little evaluation and feedback from participants
  - 'hands on' or real experience is not possible during the session

### Walkarounds

Walkarounds are essential for emergency agencies that will be responding to a specific facility or access point. Walkarounds are also useful for staff where an emergency facility is located in a restricted area. The walkarounds will require a guide, experienced in the particular environment and versed in the emergency plan. As opposed to information sessions, interaction during a walkaround occurs not only between the guide and their audience, but also amongst the session attendees, as depicted in *figure 3*.

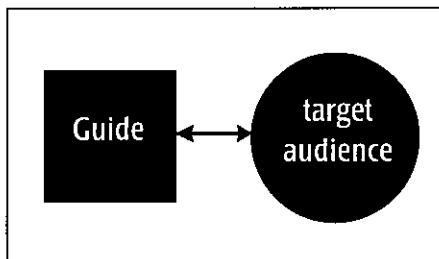


Figure 3: Walkaround exercise concept

Walking through the terminal building, for example, to a Passenger Reception Centre, will allow a responder to mentally analyse access issues, possible hazards such as media and crowds, and enable them to note reception and briefing points. This is clearly a better option than an overhead slide or video of an emergency centre.

Cupboards within a facility can be opened, phones can be casually tested and computers switched on, giving people a chance to familiarise themselves with a centre before, rather than during an event.

Walkarounds also have the benefit of creating an opportunity where staff from different companies can interact and ask questions of their host. However, like the information sessions, there is little opportunity for purposeful group interaction.

Walks should be advertised well ahead

of time and scheduled at regular intervals enabling companies to roster staff and allow for infrastructure and centre location changes to be noted by participants on a regular basis.

The advantages of hosting regular walkarounds are:

- they are relatively simple to organise
- the participants become familiar with practical response, access and facilities
- they are a good opportunity for staff to familiarise themselves with the resources within a facility
- they allow members of a small group to liaise with each other and put forward questions

The disadvantages of hosting walkarounds are:

- they allow for little liaison and practical interaction between attendees
- strengths and weaknesses of the plan or the participants cannot be gauged
- they allow for little evaluation and feedback from participants
- they may require more staff resources as small groups are often most effective and convenient

### Tabletop exercise

A tabletop exercise is one of the most commonly used exercise techniques as it is economical in its production, flexible in its format and effective in its outcomes. It allows for a non-threatening, relaxed environment which can encourage participants to discuss problems openly around an actual table. Emergency responders and staff are chosen once the aim, objectives and scenario have been created.

A facilitator is required to structure the exercise in advance, ensuring that while it is taking place, participants are guided around issues pertinent to the emergency plan and their own role during an emergency.

When choosing a facilitator it is essential that they are familiar with the plan but independent in their analysis. The facilitator should monitor the discussion, feed in added exercise information or events at pre-determined intervals, and steer the exercise as necessary. As depicted in *figure 4*, the majority of interaction occurs between the exercise participants.

A tabletop exercise can last anywhere between two and eight hours depending on the complexity of the exercise and the number of people involved. During this time staff are given opportunities to make decisions, be creative and use their own problem solving techniques in a comfortable environment. Each person is

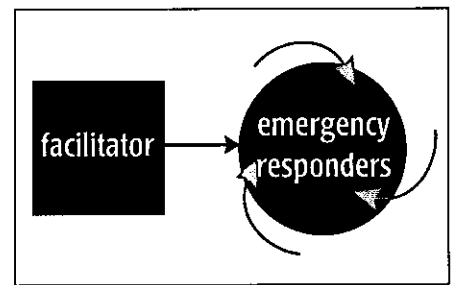


Figure 4: Tabletop exercise concept

asked to illustrate what action they would take during an emergency always keeping coordination in mind.

Uncovering better management methods during an emergency, discovering how each agency or person fits in to the plan and developing new solutions to problems are all part of the exercise.

The advantages of hosting a tabletop exercise are:

- it is a relatively stress-free exercise that allows for an imaginative environment and a real evaluation of procedures and the plan
- participants can assess their own knowledge of the plan and are given time to ask questions and make decisions
- it can be flexible allowing for the group to go on their own journey through issues, finding positive solutions
- it allows the group to gain a good understanding of agency roles, actions and limitations

The disadvantages to hosting a tabletop exercise are:

- encouraging an optimal team environment may not be easy due to frequent input and guidance by the facilitator
- the exercise may not be realistic in that one person often represents the actions of many
- it is difficult to include everyone evenly in the discussion
- it will not be valuable without a prepared, professional facilitator

### Centre simulation

A centre simulation exercise is a functional exercise requiring careful planning and a large amount of preparation. It is different from the aforementioned exercises in that it is designed to simulate the reality of emergency decision making. This type of exercise is essential in building an effective management team.

Again, an aim, specific objectives and a scenario are developed, however the scope is reduced to the operation of one emergency centre (in most cases the emergency coordination centre).

Participants and agencies specific to

the 'incident' are gathered in the coordination centre while exercise managers in a different area, preferably close by, monitor the exercise and realistically simulate both the command centres of the agencies and the control operations in the field. The close interaction between the participants and the exercise managers is depicted in *figure 5*. To simulate realistic pressure on the occupants of the centre, a scenario should be developed to enable resources to be notionally sourced from a municipal or divisional level.

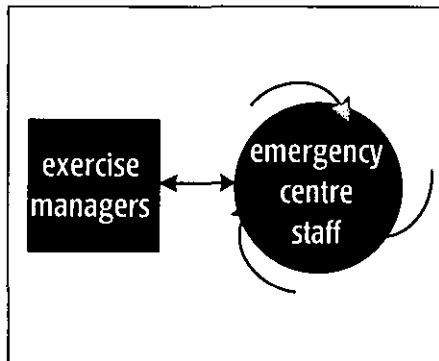


Figure 5: Centre simulation exercise concept

For example, requests from 'field commanders' are phoned or faxed into the coordination centre where exercise participants are required to make real-time decisions about the allocation of resources, usually with the help of their agency's 'command centre'. Both the field activities and the agency internal command centres are played by the exercise managers.

Hundreds of pieces of paper documenting field requests, resource allocation and situation reports are generated within the centre and are useful for closer analysis once the exercise is complete. Exercises should be planned to last between three and four continuous hours.

This exercise in its very nature builds a team environment, tests the participants' knowledge of the plan and can closely simulate the stress of emergency decision making.

The advantages of hosting a centre simulation exercise are:

- it allows the building of a team and familiarisation among staff and agencies under 'real' conditions
- participants can assess their own knowledge of the plan and their standard operating procedures in an environment where time matters—positive practical improvements can be suggested for the plan
- the actual coordination centre can be assessed for its practicality with

specific focus on the environment, communications and other facilities

- exercise management is somewhat distanced from the operational staff which allows for impartial monitoring and assessment

The disadvantages of hosting a centre simulation exercise are:

- compared to a tabletop exercise the amount of preparation, forethought and lateral thinking required by the exercise planning group is escalated
- objectives can be lost by the exercise managers due to the amount of pressure that this group also experiences
- an exercise exerting equal stress levels on all participants is difficult to generate
- exercise managers must be 'professional' in their role playing and well versed in the particular agency's operation, resources and limitations

### Field exercise

A field exercise is the best way to fully assess an emergency plan. Field exercises allow a team to be built under 'real' conditions where participants can assess their own knowledge of the plan in an environment where time matters. Extensive pre-planning and good cooperation from all involved will ensure that this type of exercise is a resounding success.

A scenario is developed for the exercise and may involve a transportation accident, fire evacuation or other field incident. The exercise should involve a number of outside agencies and can involve hundreds of people in the response and recovery at the various emergency locations and centres. Depending on the objectives, an exercise may last up to six or eight hours.

The exercise management team in a field exercise concentrates on planning the exercise, starting it and then closely monitoring the progress of participants. Interruption of the exercise by the group only occurs when an objective does not have the opportunity to be achieved due to decisions made by the participants themselves. This relationship is depicted in *figure 6*. The group will also closely monitor 'NODUFF' incidents which is a term that indicates that an authentic incident has occurred outside the exercise.

Volunteers are required for a field exercise to play victims, their families and friends and the media. However, it is recommended that due to the complex issues surrounding the handling of the media professional facilitators are employed for that particular role.

This exercise involves a real experience for emergency staff and the ability to judge aspects of the airport emergency plan and

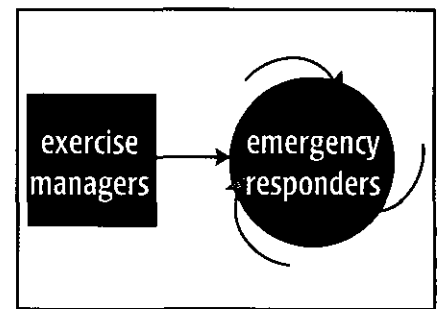


Figure 6: Field exercise concept

their own company standard operating procedures. Realistic tensions are created requiring participants to be effective in their decision making and cognisant of the big picture.

The advantages of hosting a field exercise are:

- it allows the building of a team and familiarisation among staff and agencies under 'real' conditions
- participants can assess their own knowledge of the plan and their standard operating procedures in an environment where time matters—positive practical improvements can be suggested for the plan
- emergency centres and facilities such as the emergency coordination centre and reception centres can be assessed for their practicality with specific focus on the environment, communications and other facilities
- exercise management team is distanced from the operational staff which allows for impartial monitoring and assessment

The disadvantages to hosting a field exercise are:

- compared to a tabletop exercise the amount of preparation, forethought and contingency planning required by the exercise planning group is much greater
- an exercise exerting equal amounts of stress on all agencies is difficult to generate
- a large commitment of resources is required by agencies and 'normal' operations may be disrupted
- the implementation of recommendations resulting from a field exercise may take time as facilities rather than planning issues are often targeted

### Creating an exercise plan

In exercising an emergency plan, especially for the first time, a building block approach should be utilised. Before a full field exercise is attempted, information sessions must be conducted to introduce the various aspects of the plan and walkarounds held to famil-

iarise staff with facilities and procedures. Tabletop exercises and centre simulations can subsequently be carried out where key recommendations are drawn and implemented, and apparent errors in the plan are corrected. A field exercise must then be conducted to ultimately test the plan.

In any exercise it is critical to always work from the plan to ensure that it is the plan in its current format that is tested. Simple scenarios can be used to find further events that the plan made need to cover. The plan must never be considered one dimensional where each scenario is compartmentalised. It should be general enough to cover a hundred scenarios but specific in outlining operational procedures and responsibilities. Exercises validate a plan and ensure that the plan grows to accommodate various circumstances that may have been initially unforeseen.

### The exercise planning group

An exercise planning group will initially need to be formed with enthusiastic and experienced staff from various fields relevant to the exercise scope. The company responsible for the plan will usually convene this group.

The reputation of a company's plan may depend on the thoroughness and professionalism of consultation and planning with all stakeholders before the exercise commences.

Airport emergency exercise planning groups are made up of representatives from the Airport Authority, Police, Fire Service, Ambulance, Airline and various other planners depending on the objectives the group hopes to achieve. It is often the case that this group will grow as the planning advances.

For an information session, only one or two meetings may be held prior to the event, but for a full scale field exercise, planning may commence six months or more before the day, with meetings held at monthly or fortnightly intervals. Minutes should be kept to document each meeting, noting agreements and decisions made by the exercise planners.

Planning an exercise can also be considered a valuable experience for the staff involved as they will be working through issues that reflect problem solving in real emergency situations.

### Exercise aim

The aim of an exercise is a global statement usually one sentence in length and can often indicate what type of exercise will take place. The aim is usually stated as to 'test', 'train', 'analyse', 'review'

or 'understand' a component of the emergency plan at a certain level (ie. executive management group, entire company, multi-agency etc.). The aim is broad and viewed from the perspective of the exercise managers.

For example: The aim of the exercise is to test the Airport emergency plan in a multi-agency response to an aircraft incident west of the airport.

### Exercise objectives

Objectives will often gauge how 'big' an exercise will be and is a breakdown of the aim. Again the prefix of 'test', 'train', 'achieve', 'workshop', 'gauge' or 'understand' is attached to the front of the following examples:

- callout
- communications
- care of customers, visitors, staff
- new plan processes before implementation
- staging areas
- environmental impacts
- scene isolation
- facilities
- response arrangements
- systems
- recovery arrangements
- individual agency objectives
- incident control point
- teamwork
- traffic isolation
- command arrangements
- media centre
- control arrangements
- reception centres
- coordination
- information desk
- equipment
- public announcements
- language barriers
- briefing
- handover
- contractors
- assembly
- emergency coordination centre

A field exercise may have up to twenty objectives, where an information session may have just one or two. Objectives are specific and represent the perspective of the exercise participants.

### Exercise scheduling

The scheduling of an exercise is the next issue the group should consider. What time of the year should the exercise be conducted? Seasonal weather may become a factor in a field exercise; rain impeding vehicle access to a site and heat affecting volunteers. Should the exercise be held at night or on a weekend to identify staff resources and gauge realistic response times? Will the exercise affect

normal company operations at certain times? Conflicting events such as other exercises or scheduled events with the potential of a real response will also be factors in scheduling the exercise.

### Exercise host

Usually a host is identified for an exercise. An exercise host takes on the responsibility of providing facilities, staff and other resources. For example: Does an international airline with staffing constraints want to test coordination with their handling agent? Does a specific tenant want to test their warden response in an evacuation exercise? Does a refuelling company want to achieve set objectives for a major fuel spill?

In all the above cases strong commitment of the host is necessary. For example, airlines will have to consider the use of aircraft, ground staff, terminal staff and engineering staff whereas the airport operator will have to consider disruption to airfield and terminal services.

### Exercise budget

Exercises need to be budgeted for in staff, money and facilities. Advanced thought needs to be given to the cost of equipment hire, exercise facilitators, transport hire, donations, catering, video production, staging and props, radio hire, tabards and signs (figure 7).

### Exercise scope

The scope of an exercise can also cause constraints to exercise realism. Will the local council be involved or simulated? Will the exercise extend to Air Traffic Control simulating the flight path of an aircraft?

Other factors affecting the scope are listed below:

- local, municipal, divisional or state involvement
- emergency facility simulation
- exercise budget
- public participation
- use of restricted areas
- use of buildings
- scripts for emergency responders
- use of facilities (ie. exercise hospital?)
- on site response
- resulting injuries
- off site response
- resulting deaths
- exercise length

It is important to clearly state the exercise scope in briefing notes to avoid any confusion or embarrassment on the day.

An example of an exercise scope is:

- The exercise has been planned to test facilities on airport. It is not intended





Figure 7: Signage and equipment hire is only a small part of an exercise budget

that passengers who receive injuries be transported to hospital. Consequently a drop off point will be established on the airport for the ambulance. Deaths will result from the accident. The emergency vehicles responding to the accident may be staged at a pre-staging area before the exercise commences.

#### Exercise location

The location of the exercise must be chosen carefully as it can affect normal operations of a company and in some cases the community surrounding the exercise area. Choices need to be made with reference to:

- incident site positioned within property boundary
- use of external facilities (ie. local hospital)
- use of a certain facility that is part of your core business (ie. runway)
- use of emergency centre facilities
- off site (ie. in a field, gully or river)
- use of a building or room (ie. boardroom)
- use of access roads (private/ public)

#### Exercise scenario

The exercise scenario sets the scene of an incident and is often geared to what response and recovery arrangements the emergency plan provides. Exercises can test the response to a specific unplanned event and outcomes may indicate that further planning is required in that area. The scenario is the storyline and encompasses the general and special ideas.

Types of situations that may be planned for by a company within a corporate crisis framework may be:

- bankruptcy
- plant closure
- boycott
- strikes
- bribery
- takeover
- lawsuits
- workplace violence
- fatality within the work environment
- murder

Scenarios for an airport emergency exercise are usually built on what is provided for in the airport emergency plan, that is:

- crash
- suspect article
- full emergency
- terminal/building fire
- bomb threat
- criminal act
- hijack
- medical emergency
- hazardous materials incident
- natural disaster
- fuel spill
- ground fire
- disabled aircraft
- protest
- community request
- blockade
- chemical, biological, radiological threat
- crowd control
- aircraft fire

An example of an airport exercise scenario is:

*'A Boeing 767-300 coming from overseas via Perth, fails to make the airport perimeter. There are one hundred and twenty people on board, made up of one hundred and ten passengers and ten crew.*

*Two diplomats are also on board the aircraft.*

*It is a devastating crash, killing sixty and severely injuring forty others. Nevertheless there are twenty uninjured/slightly injured passengers, some with no English language. Twenty legitimate meeter/greeters are gathered at the terminal, although thirty to forty people respond to the meeter/greeter reception centre.'*

In most cases the exercise participants are aware of the scenario though pre-briefings and before the exercise have the opportunity to go through in their minds what this scenario could mean for them. For example in the above scenario:

- what are the surrounds of the airport? residential? steep/flat terrain?
- where are the access roads?
- will political involvement be likely due to the diplomats?
- where will interpreters be sourced?
- how will the authentic meeter/greeters be identified?
- will both the airport and local fire services be involved?
- what time of day will it occur?

#### Exercise code name

What is an exercise without a punchy or memorable code name? A name like 'night sky' is short and sweet, yet evokes images of an emergency response during the cover of darkness.

Industry terms could also be used, for example at an airport, exercise 'stickshaker' or exercise 'is that the runway?'. Whatever name is chosen, it should be applicable and used in the distributed information. It must also be used on communication circuits throughout the exercise to clearly indicate exercise traffic.

#### Agency involvement

The size of an exercise will also depend on the agencies and companies invited by the planning group to participate. Following is a list of players that may be considered in an airport exercise:

- Airport authority
- State Emergency Service
- Police
- Metropolitan Fire Brigade
- communications provider
- Country Fire Authority
- Ambulance
- Australian Customs Service
- Environment Protection Authority
- Australian Protective Service
- Department of Transport and Regional Services
- Australian Quarantine and Inspection Service
- Aviation and Rescue Fire Fighting
- Department of Immigration and Multi-





Figure 8: Many agencies will be involved in a Field or Centre Simulation exercise, especially when an Emergency Coordination Centre is activated



Figure 9: Volunteers are a valuable resource of experience and information and should be treated accordingly

- cultural Affairs
- power company
- Salvation Army
- gas company
- Red Cross
- water company
- Health Department
- City Council
- coroner
- actors and volunteers
- St John Ambulance
- politicians
- Road Authority
- Australian Transport Safety Bureau
- Defence Force - Special Air Services
- Air Traffic Control
- hospitals
- Department of Human Services
- independent Counsellors/ Carers
- Department of Natural Resources and Environment
- emergency service communications provider

### Volunteers

Volunteers are an integral part of any large emergency exercise. They can be sourced from the local community, universities, high schools and volunteer organisations. Perhaps the most valuable volunteers however, are company staff. Actually playing the part of a person involved in the emergency can provide responders themselves with an insight into the victims experience. An important source of recommendations can come from their participation, therefore all volunteers must be thoroughly debriefed.

Only volunteers above the age of fifteen are recommended and special insurance provisions should be investigated. More than the required amount of volunteers should be sought due to last minute withdrawals.

Volunteer Briefing Notes are distri-

buted to participants in advance. The notes should cover topics such as:

- welcome
- security arrangements
- catering (ie. do they need to bring food, vegetarian considerations etc.)
- 'NODUFF' arrangements (who to look to for authentic help)
- exercise scenario (from the perspective of the volunteer)
- exercise aim and objectives
- what to expect (a brief outline of the exercise experience)
- smoking arrangements during the exercise
- how to register (where to park, where to go)
- site safety and first aid arrangements
- what to wear
- leaving arrangements
- are they fit to participate (ie. do they suffer from claustrophobia, or have they experienced a similar traumatic experience)
- how to act (a description of realistic symptoms such as shock etc.)

Once registered on the day, a security pass or name tag may be necessary. An exercise card or tag on a neck chain or clip can provide volunteers with an easy reference to key exercise 'rules' or site plans or diagrams during the exercise. Any written documentation such as manifests, data etc. that would normally exist as a result of the emergency should be prepared in advance.

Pre-briefing and de-briefing of participants is essential. The opportunity for last minute questions and a quiet time for volunteers to de-role can be invaluable to the exercise management group—misconceptions of the day can be rectified and recommended changes to the plan can be made.

Follow-up of volunteer participation in

an exercise is a method of thanking them for their efforts and gaining further information of their experience after the event. A week after the exercise a more objective view of the day will be possible. A small token of the exercise planning committee, such as a T-shirt ('I survived Exercise...') is always welcome.

### Observers

Observers, hosts, referees and exercise managers can be best described as exercise 'ghosts'—they are there to view a process rather than actively participate.

Careful consideration as to the involvement of observers in an exercise is necessary. An exercise such as an information session or a walkaround does not promote the involvement of observers, however centre simulation and field exercises often generate the interest of staff who do not want to be directly involved.

The benefit of observing an exercise is limited. For example a centre simulation exercise is difficult from an observation perspective due to the limited space that may be available in the centre and the difficulty with being able to follow the decision making process and exercise progress.

Similarly, observers participating in field exercises must be carefully managed to ensure that simply viewing a process does not become boring. In most cases, interested staff should be encouraged to participate in the exercise as a volunteer or responder to gain the maximum benefit from the day.

Field exercises promote the most interest for viewers often because of the 'lights and sirens' response—there is smoke, anticipation and movement. Observers should therefore be invited to attend an exercise or agencies asked to



Figure 10: Observers should be managed as if participating in a Walkaround

fill one or two observer positions to ensure a manageable observer group.

Preparation for observer involvement begins with the distribution of observer briefing notes. The notes should cover topics such as:

- welcome
- what to wear
- aim and objectives of the exercise
- exercise transport arrangements
- exercise scenario
- the role of an observer
- what to expect (a brief outline of the exercise experience)
- how to register (where to park, where to go)
- leaving arrangements
- site plans
- observer protocols (ie. do not wander from the group, ask before entering an active emergency centre etc.)
- catering (ie. do they need to bring food, vegetarian considerations etc.)

### Hosts

The host role is to look after the observers. The hosts are staff familiar with different agency response procedures and the emergency plan.

A pre-briefing should be conducted for the observers by the hosts prior to the exercise commencing, again to clarify issues and to enable the formation of realistic expectations by the observers. Information packs can be given out to the observers during the day, outlining emergency facilities, roles and responsibilities.

Small groups of observers are manageable for hosts and permission to enter most management centres is likely to be granted. Questions are to be encouraged during lulls in the exercise 'action' and comments from the observers logged for

later analysis in conjunction with formal exercise recommendations.

Notes to exercise hosts can also be developed addressing:

- welcome
- catering arrangements
- aim and objectives of the exercise
- exercise transport arrangements
- exercise scenario
- role of the host team
- assembly of the host team
- thank you
- observer protocols (ie. do not wander from the group, ask before entering an active emergency centre etc.)
- administrative arrangements

### Referees

There is little point to an exercise without the formal assessment of the response and recovery operations with specific reference to the exercise objectives. Referees are a vital component to an exercise.

Careful briefing of referees is required and is best carried out in the week before to ensure preparation time is given. Again, briefing notes compiled outline:

- referee protocols (ie. do not interact with the exercise players)
- catering (ie. do they need to bring food, vegetarian considerations etc.)
- aim and objectives of the exercise
- referee prompts or detailed checklist
- exercise scenario
- welcome and thank you
- what to expect (a brief outline of the exercise experience)
- use of photography in exercise analysis
- how to register (where to park, where to go)
- maintenance of exercise logs
- what to wear
- written report expectations
- exercise transport arrangements (will

they respond with their own agency etc.)

- oral debrief report expectations

The exercise planning group must ensure the referee understands the role and is committed to a written report and/or oral presentation. The most successful refereeing comes from those who have an understanding and objective view of the Emergency Plan.

### Exercise management team

The role of the exercise management team, made up of a director and control staff is to manage the exercise on the day. Scheduling must be adhered to, a definite start and finish to the exercise must be made clear and careful attention to 'NODUFF' situations given.

For small exercises only one person may be needed. Large field exercises though, often require a large group of exercise control staff positioned at various key points (ie. incident control point, emergency coordination centre etc.). The exercise management team are best linked by radio enabling the whole group to hear all communications and respond immediately to 'NODUFF' situations.

The goal of the exercise management team is to give every opportunity to the exercise participants to achieve the set objectives. Timing can be somewhat flexible and in extreme circumstances the exercise could be stopped, rewound and re-played.

Where an exercise has a large number of objectives or is complicated in format, the best people to play the role of an exercise director or control staff are those who developed the exercise in the first instance—the exercise planning group. The exercise management team can also play the part of referees in this instance.

### Media involvement

Centre simulation and field exercises present an opportunity to test the media or crisis communications component of the emergency plan. Staff are often well versed in the operational response and immediate recovery aspects of an emergency, but the media coverage of an incident will be the image that lingers in the public mind.

It is recommended that facilitators are employed to allow realism, professionalism and essential feedback which can take the form of a six o'clock news report, radio report or a newspaper article.

Multiple agencies should commit their public affairs staff to the day to ensure that coordination is tested. Too often, companies can be played off against each

## Foot and Mouth Disease

The outbreak of Foot and Mouth Disease (FMD) in the United Kingdom and other parts of Europe has been a catalyst for Australian governments to focus on arrangements for dealing with the outbreak of an exotic animal disease such as FMD. The Council of Australian Governments (COAG) recently noted that if a significant outbreak of FMD occurred in Australia, the technical, logistical, social and financial responses needed to manage the situation would be on a whole-of-government level not experienced before in peacetime.

COAG has established a high-level task force to coordinate the development of frameworks for the prevention, preparedness and management of a major emergency disease outbreak. At the Commonwealth level, EMA will be working with Agriculture, Fisheries and Forestry—Australia (AFF-A) in the development of these frameworks.

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## Consequence Management Group (CMG)

EMA hosted a meeting of the international Consequence Management Group (CMG) in Canberra on 21–23 May 2001. Representatives from Canada, United States the United Kingdom and Australia conducted a series of briefs on the arrangements each country had in place to plan for and respond to Chemical, Biological and Radiological (CBR) incidents.

While the meeting focused on the CBR arrangements that were developed for Sydney 2000, Canada, the US and UK provided briefs on specific CBR developmental issues which will be considered by the new Australian National CBR working group when it meets in August 01.

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## AUSASSISTPLAN

The Australian Government Overseas Disaster Assistance Plan (AUSASSISTPLAN) is prepared and maintained by EMA on behalf of the Australian Agency for International Development (AusAID) as a contingency plan for providing assistance to overseas countries during disasters.

AUSASSISTPLAN has recently been re-issued following a comprehensive review which included wide consultation with key stakeholders and Commonwealth agencies.

Copies can be obtained from EMA.

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## INSARAG Convention

The second meeting of the core group developing a Convention on International Search and Rescue was held in Geneva during 20–21 June 2001. Twenty four countries including Australia were represented. The meeting debated issues concerning the content of the proposed Convention which is being developed out-of-session via a World Wide Web based Virtual Secretariat.

Development of the Convention is progressing well and a number of Core Group Countries are to prepare a resolution for tabling at a meeting of the United Nation's Economic and Social Council (ECOSOC) encouraging countries to continue efforts aimed at improving international Urban Search and Rescue assistance.

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## Flood assistance—Kempsey/Grafton area

In early March, severe flooding of the Clarence and Macleay Rivers in the Grafton/Kempsey area of New South Wales resulted in a number of communities being isolated.

On 10 March, the New South Wales Government requested Commonwealth assistance with the provision of helicopters to help evacuate personnel from Smithtown, a small community in the vicinity of Kempsey where there were potential community health problems due to the failure of public utilities through flooding.

The Parliamentary Secretary to the Minister for Defence, Dr Brendan Nelson, approved the request and a total of 13 Australian Defence Force Chinook, Sea King, Iroquois and Blackhawk helicopters were deployed to the area to assist with evacuation, resupply and other support tasks.

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email: [dpatterson@ema.gov.au](mailto:dpatterson@ema.gov.au)

## Flood assistance—Northern and central regions of Western Australia

Heavy rains throughout April caused flooding in the northern and central regions of Western Australia. A number of communities including Mulan, Balgo Hills, Ringer Soak and Yagga-Yagga were isolated for a number of months with fuel for their electrical generating facilities running short.

On 23 April, the Western Australian Government requested Commonwealth assistance to air transport over 300 drums of fuel to these communities. The task was approved by the Parliamentary Secretary to the Minister for Defence, Dr Brendan Nelson, and the Australian Defence Force deployed RAAF C130 Hercules and Caribou aircraft to undertake the task.

A further request for assistance from the Western Australian Government was received on 21 May. This was to transport 260 drums of fuel to Kiwirrkura, an isolated community in the Gibson Desert which had been evacuated earlier in the year. The fuel was required to power engineering equipment to enable reconstruction of the flood devastated community to commence. The Australian Defence Force deployed a Chinook helicopter from Townsville to undertake the task.

For further information contact:  
Don Patterson  
phone: 02 6266 5165  
email: dpatterson@ema.gov.au

### **The national summit—International Year of Volunteers**

#### **Emergency Services volunteer training scholarships/exchange program**

Initial discussions have been held regarding the establishment of an Emergency Services volunteer training scholarship or exchange program. The general idea of the program would be to provide travel and accommodation for volunteers to spend up to two weeks with another emergency service or non-emergency service agency. Volunteers would examine such issues as administrative structures, volunteer recruitment and management, rescue techniques, best practice, innovation etc. EMA will further develop the concept in conjunction with State/Territories.

For further information contact:  
David Winterburn  
phone: 02 6266 5009  
email: dwinterburn@ema.gov.au

#### **Emergency volunteer employer recognition scheme**

EMA is currently examining the possibility of developing a recognition scheme for employers that release staff for emergency volunteer training and operations. EMA recognises the important role that employers play in ensuring that volunteers are able to attend the scene of an emergency or disaster and undertake the necessary training. Basic research will be conducted to determine what schemes are currently used by the emergency services to recognise the support of employers, and, if a need for a national approach is identified, what form should such recognition take?

For further information contact:  
Donna Cain  
phone: 02 6266 5317  
email: dcain@ema.gov.au

## **What's on at AEMI**

### **Course in emergency management for local government**

Local government is widely recognised as a key player in emergency management. There are now greater expectations placed on local government personnel to implement a range of measures to manage natural and human made risks. AEMI is delivering a new course aimed at providing local government personnel with the basic knowledge to effectively carry out their emergency management responsibilities. The audience for this course is people who work in local governments all over Australia who have some emergency management responsibilities or who may be involved at some level. This audience also includes elected members. The course does not assume any prior knowledge of emergency management practice.

The topics covered in the course include:

- the nature of disasters and emergencies
- understanding the impacts and consequences of emergencies for local government
- emergency management concepts and principles
- community vulnerability and resilience
- developing risk prevention, preparedness, response and recovery strategies through emergency risk management
- linking emergency management to corporate governance

The first course will be run in the second week of Oct 2001.

For further information contact Mark Scillio  
phone: 03 5421 5292  
email: mscillio@ema.gov.au

### **Emergency Management and Australia's remote indigenous communities**

As part of the National Emergency Management Studies Program, EMA is embarking on a study of emergency management and Australia's remote indigenous communities. Broadly, it is expected that the outcomes of this study would support and enhance Australia's emergency management capabilities and further community understanding.

From July to mid September 2001, EMA is seeking input to scope the nature of this study. Your input will be valuable in determining the direction. Although not all suggestions will be able to be addressed in this first instance, they will be documented for further research.

For further information contact Louise Mitchell  
phone: 03 54215 76  
email: lmitchell@ema.gov.au

### **Psychological services in the disaster context**

Recognising the different context in which psychological services need to be delivered to disaster affected persons the Disaster Recovery sub-committee of the Community Services Ministers Advisory Council and the Australasian Society for Traumatic Stress Studies sought funding through EMA's National Studies Program to develop Guidelines for best practice.

With the success of this submission a workshop was held at AEMI, featuring representation from the range of government and non-government agencies involved in the delivery of psychological services in the disaster context. Professional disciplines represented included psychiatry, psychology, social work and other related fields. Drawing on information from the workshop and a variety of other sources two publications have now been developed:

- Psychological Services in the Disaster Context: Guidelines for Psychological Service Practice
- Psychological Services in the Disaster Context: Guidelines for Disaster Management Practice.

The first of these publications has been developed to assist the delivery of psychological service practice in the disaster context by appropriately qualified practitioners. The second publication is designed to offer service providers, managers and practitioners a guide to the delivery of psychological service practice in the disaster context. Final drafts of both publications are now available for perusal via the EMA website (Virtual Library).

For further information contact Andrew Coghlan  
National Training Consultant, Disaster Recovery  
phone: 03 54215240  
email: [acoghlan@ema.gov.au](mailto:acoghlan@ema.gov.au)

### Training needs assessment

AEMI is currently undertaking a training needs assessment to significantly contribute to the further development of well targeted education and training activities by the Institute. The Training Needs Assessment Project has used a variety of data collection methods over the last two months to involve a wide range of people with emergency management responsibilities. A delphi survey conducted by email and teleconferences were the first two stages of data collection. Currently a series of interviews are being conducted using the material gathered in the earlier data collection stages. State and Territory training managers have been instrumental in identifying the cross section of people in the emergency management industry in their particular State and Territory. Commonwealth representatives have also been included in the project.

For further information contact Paul Quinn  
phone: 03 54215225  
email: [pquinn@ema.gov.au](mailto:pquinn@ema.gov.au)

## School Education News

### Hazards Happen: a teacher's guide

*A Teacher's Guide to Hazards Happen* is at the printers and will be available with purchases of the CD-ROM *Hazards Happen*. The guide represents a multi-disciplinary approach to teaching about hazards by intersecting with curriculum in a variety of key learning areas. Teachers of Art, Science, English, Maths and, of course, Geography will find valuable and innovative approaches to teaching and learning in this publication. The guide targets students from years 3&4 right through to years 11&12. People who have already purchased the CD-ROM will have a free teacher's guide sent on to them. For information on how to order *Hazards Happen*,

telephone 02 6266 5402, or check the EMA website, School Education section at [www.ema.gov.au](http://www.ema.gov.au).

### In search of Emergency Management artefacts

A terracotta roofing tile with a 3 cm hole punched neatly through its centre; pieces of barbed wire fused by some kind of electric force; a quarter window from an EJ Holden sandblasted into opacity: what do they all have in common? They are all emergency management artefacts and we are in search of more. Can you help us? We are hoping to use such objects to enhance the display at the National Science Festival, held annually in Canberra. If you know of any curios like these, and how to access them, we would appreciate your help.

Please contact Russell Forster  
School Education Officer, EMA, Mt. Macedon  
Phone: 03 5421 5242  
email: [russell.forster@defence.gov.au](mailto:russell.forster@defence.gov.au)

Artefacts provided could be on a loan basis, if required. Full credit and acknowledgment guaranteed. By the way, the tile was holed in the Sydney hailstorm; the barbed wire was part of a fence struck by a thunder bolt and the quarter window was sandblasted during a severe wind storm at Port Hedland in 1975.

## EMA publication news

New and revised publications now available (as noted below in each category):

### Australian Emergency Manuals Series

Part IV—Skills for Emergency Services Personnel

Manual 7 – Map Reading and Navigation (2<sup>nd</sup> Edition)

*(Free copies for EM agencies available through your State/Territory Emergency Service training section. Other enquiries to EMA.)*

### Community Awareness and Education

*Earthquake and tsunami awareness for Australians* (fully revised colour A5 size pamphlet, now also covering tsunamis).

*Natural Hazard Awareness for Queensland* (new colour B2 size poster showing a brief text and pictorial history of the State's major natural disasters).

*Free copies of the pamphlet are available through your State/Territory Emergency Service and the poster is available only through Qld Counter Disaster and Rescue Service.*

### Mount Macedon Papers

*Note:* These workshop records were published in booklet form for all 'Papers' on workshops held up to the end of 1998. All Mount Macedon Papers from then onwards will be available on the EMA Web site.

**EMA** addresses for publication orders (first check above for appropriate State/Territory authority or EMA office):

Emergency Management Australia  
PO Box 1020, Dickson, ACT 2602

Australian Emergency Management Institute  
Mt Macedon Road, Mt Macedon Vic, 3441

# GDIN 2001

## Canberra Statement

### 'Improving the flow of disaster information from those who have it to those who urgently need it'

We, the participants of the GDIN2001 Conference, recognise that disasters continue to have devastating effects on people, property, and the environment. We recognise that there needs to be increased international cooperation to assist countries and regions to take advantage of accelerating developments in information technology so as to make a positive contribution in risk assessment, mitigation, preparing for, responding to and recovering from disasters.

Such cooperation requires active participation by governments and their agencies, commercial organisations, non-governmental organisations, academic institutions, learned bodies and individuals. GDIN is a politically neutral and an independent public-private partnership.

Since the inaugural GDIN Conference in Washington DC in July 1998, through GDIN Conferences in Mexico City (1999) and Ankara (2000), there has been substantial progress to make a reality the GDIN vision to ensure that the right information is provided to the right people on time in order to make the right decisions. The Canberra conference carried that vision forward.

At the Canberra Conference, we have agreed to the GDIN Business Plan, which identifies its future directions and a range of services for sharing disaster information that GDIN will implement over the forthcoming year. These services include:

- a database of GDIN participants highlighting expertise, information capabilities and contact details
- a proposed network of disaster information specialists has been established which can respond actively to requests for information by facilitating information flow and linking users and providers of that information
- a GDIN internet-based system which provides effective access to national and regional information networks, and international sources of disaster information from around the world.

We recognise that a major advantage of GDIN has been the development of partnerships within the global disaster management community. GDIN will continue to pursue strategic relationships with those who have a role in improving the flow of information in disaster management. The number of organisations who have that role—government and non-government and private sector—is growing rapidly as technological advances gather pace globally.

In association with clarifying GDIN's role to facilitate information sharing, delegates gave commitment to and endorsed the principle of formalising the GDIN organisation and agreed to pursue a strategy to attract funding from sponsors to support GDIN services.

The Conference particularly emphasised that GDIN foster the development of regional and national disaster information networks and provide the leadership and advocacy of information sharing at the national and regional levels. This had special meaning for Australia and the Asia Pacific region where strengthening the information networks is an important objective based on the understanding that many countries do not have ready access to all the technological options. A significant event during the Conference was the launch of the ReliefWeb Asia office to be situated in Kobe, Japan, which will provide improved coverage of disasters in the Asia Pacific region.

Significant achievement has been made by the Working Groups. They identified a series of tasks for the next year in support of GDIN's Business Plan. Common themes identified included initiation of activities to more closely identify and serve user needs, continue to build the people network and to pursue demonstration projects. One of these will be the adoption of a unique reference number for disaster events.

The Conference has congratulated Larry Roeder from the US State Department who was re-elected as Executive Director, Karen Risa Robbins as the Fund Director, and AmTech Alliances as the provider of Secretariat services.

The Conference paid tribute to the Australian Government, the Australian GDIN Conference Committee, the exhibitors and major sponsors, (the Australian Agency for International Development, the Bureau of Meteorology, and Australian Geological Survey Organisation), and to Emergency Management Australia for the organisation of a highly productive Conference.

The conference is delighted to accept Italy's offer to host the next conference—to be held in Rome in June 2002.

In conclusion, we note the real maturing of the GDIN organization, characterized by deep and more productive relationships between its members.

The 2001 conference marks a watershed in this process of maturity, and provides a clear demonstration of the performance and the potential of GDIN in improving the ability of disaster managers to prepare for and cope with a very wide range of emergencies. This is especially important for countries who need significant support from those who need it.

This successful Conference provides the platform for a challenging year ahead focused on implementing the Business Plan which calls for progress on many fronts including sponsorship, relations with governments, cooperative partnerships and the effective use of technology and its simple application to reduce the impact of disasters on communities in every part of the globe.

other if a coordinated response is not obvious. Joint media conferences, call taking, information gathering and dissemination are good aspects of the media plan to exercise (figure 11).

### Public awareness

A large company is often part of the wider community and it is sometimes the case that neighbours can be left out of the information loop. Large impacts such as planned exercise road diversions should be advertised.

An exercise with little community impact may still require a letter drop or some form of road-side signage to ensure minimum inconvenience to the surrounding community.

The media could also be informed that an exercise is taking place as calls could be placed to them by misinformed and concerned neighbours.

Staff, other tenants and other key companies should be informed up to a week before the day of a large field exercise. On the day itself, signage and PA announcements can notify staff and visitors to the area of the exercise and its impact.

### General briefing notes

General briefing notes are an essential component to any exercise. They are often sent to all emergency plan holders notifying them of the event and enabling them to assess whether or not they have a part to play. If their agency is not involved, then there may be a chance for them to observe or ask to expand the scope to include their own agency objectives.

The general briefing notes include:

- introduction (an explanation of why the exercise is being held)
- response by participating organisations
- exercise aim
- transport arrangements
- exercise objectives
- catering arrangements
- pre-exercise briefing
- type of exercise
- scope of exercise
- site safety
- observer arrangements
- escorts to Site
- exercise code name
- first aid
- scenario
- smoking arrangements
- administration
- security arrangements
- public relations
- pre-exercise training
- exercise management
- exercise debrief
- exercise comments and recommen-



Figure 11: An inter-agency media conference at the end of an exercise is an excellent opportunity for companies to practice 'a united front'

- dations
- volunteers
- summary
- exercise constraints
- referee arrangements

### Site preparations

The preparation of an exercise site, whether it be in an emergency centre or out in a paddock, is important for the protection of exercise participants. Phone cords should be taped to the carpet; rough or steep ground should be graded. Thought needs to be given to the placement of a field site—is it near an operation that could lead to the distraction of exercise staff? etc. Occupational Health and Safety and insurance matters must be addressed well before the day.

Placement of props such as 'bodies' (mannequins), water based red paint (blood) and rubbish, simulating break-up is to be carefully positioned. Smoke machines, flares and water hazards also need to be placed in safe areas to protect the exercise participants. Steep drop-offs, boggy areas and hidden drains and

culverts are to be marked so they are highly visible in poor or low light conditions. The exercise environment should be made as comfortable as the exercise scenario allows.

### Moulage

Where a field incident with injuries is planned, moulage (make up) is a method employed to add realism to an incident scenario. Depending on the scenario, an agency such as the ambulance service is asked to provide a list of injuries that would be likely to result from the emergency.

Make-up artists, from volunteer agencies or various universities prepare the victims, often briefing them on the symptoms they should voice during the exercise. Participating volunteers should be encouraged to wear old clothing.

### Site first aid

Site first aid is recommended to be provided where physical activity is planned, for example a large scale field exercise. Volunteer organisations may be able to provide staff to fulfil this role.



Figure 12: Mannequins, old clothes, chairs etc. make ideal props for an incident site

If a site first aid officer is not going to be employed for the exercise, alternative arrangements must be prepared. An exercise manager for example, may be tasked with a 'NODUFF' emergency callout.

### Agency preparation

It is up to the individual agency as to how it prepares its staff for an exercise. Depending on the type of exercise and the individual objectives of the agency, it may be used as reinforcement of recent training, training itself or as a test of plans.

To avoid any misunderstandings between a real incident and an exercise however, it is recommended that staff are at least informed of the exercise date and that they may be required to participate.

### Contingencies

It is rare for exercises to be changed or cancelled at the last minute, however the exercise planning group must be prepared with a contingency plan. Some problems to consider are rain, heat, fog, hail, other conflicting events, industrial strikes, product demand and authentic emergencies.

A contingency plan may be: if it rains the field exercise will be cancelled and only the media centre and emergency coordination centre will be activated through a centre simulation exercise, or a tabletop exercise will explore a similar scenario. It is important that all agencies are aware of any contingency plans well before the exercise date and that there is a method for relaying this to everyone on the day.

### Pre-exercise briefing

Exercises of a large nature such as a field or centre simulation exercise should include a pre-exercise briefing for all participants or single agency representatives, about a week before the exercise. The briefing can take different formats depending on the objectives of the exercise. Some examples are:

- a tabletop exercise focusing on the scenario of the field or centre simulation exercise
- a briefing of the emergency plan and how it applies to a certain scenario
- a briefing of what is expected from the exercise participants
- a briefing of the exercise scenario combined with an information session
- a briefing of the exercise scenario combined with a walkaround

### Exercise hot debrief

A hot debrief usually refers to the exercise participants meeting directly after the exercise and is designed to allow a forum



Figure 13: Moulage can assist emergency responders in gauging the gravity of the emergency

for people to voice their feelings as to how the exercise progressed. This meeting is usually emotionally charged and therefore should be professionally facilitated by a person who can draw both recommendations for change and positive aspects from the day. A hot debrief can pick up issues that may be forgotten in coming days and is also designed to de-role the staff.

Walkarounds, information sessions and centre simulation exercises often involve all agencies during the debrief and is usually the only debrief conducted. A field exercise hot debrief should be conducted in single agency groups due to the amount of people involved and the tensions that are sometimes experienced between agencies immediately after the exercise.

### Full debrief

A full debrief occurs approximately a week after a large exercise and is designed in this fashion to allow an agency reconciliation of its own recommendations. It also enables participants time and distance to critically consider the achievements of the exercise with reference to the objectives, away from the 'heat of the moment'.

A full debrief is a structured meeting where time is given for each agency referee to reflect and report on the exercise outcomes from their perspective, offer recommendations for future exercises or changes to the plan, and also gives the opportunity for considered questions.

All debriefs should be treated as a positive experience where conduct guidelines for participants are set out by the facilitator at the beginning of the meeting.

### Exercise report

The exercise report and the implementation of recommendations are the most important end products of an exercise. The exercise report is a culmination of referee reports, observer and volunteer comments and of the outcomes of the full debrief.

Carefully structured in its design, the report should be an honest representation of the exercise and is approved by the exercise planning group before its release to all emergency plan holders. A report for a full field exercise is written within a month or two of the exercise. A suggested report layout is below:

- synopsis or executive summary—the concept of the report, an accurate overview, the conclusion and general outline of recommendations
- table of contents—an outline of the sections of the report with reference to page numbers
- introduction—the purpose and objective of the report is identified
- a brief outline of the exercise planning group—detailing the charter of the group and how effective the group was in its production of the exercise (the exercise management team may also be mentioned here)
- the exercise aim and objectives—as set out prior to the exercise
- the exercise scenario—as described in the general briefing notes, but in past tense
- participating organisations—a list of those companies and agencies who participated in the exercise
- participating volunteers—a list of those organisations who supported the exercise with volunteers
- sequence of events (master schedule)—



a concise table of times and relevant actions or events

- exercise critique and recommendations—the main body of the document where the various sequential exercise objectives are the section titles—the objectives are addressed stating basic facts with reference to quotes etc. and are followed by clearly defined recommendations
- attachments such as the referee reports, noted other reports, notes of the full debrief—appendices in logical order added with the approval of the author
- summary—where logical conclusions are drawn from the exercise critique
- thank you—an opportunity to thank specific people or organisations for their time and significant participation in the exercise planning or management

Implementation of recommendations  
Once the exercise report is written and released to the wider community, areas identified within the report are to be addressed by the emergency planning committee, prioritised and then actioned over the coming months.

Emergency exercise areas of improvement can usually be split into four categories; personnel and agency coordination, communication, facilities and plans, policies and procedures.

## Conclusions

The importance of exercising an emergency plan cannot be overstated. Emergency agencies and companies can interact, exchange ideas and form relationships that will better assist the response to an emergency situation. Staff are able to consolidate their understanding of the emergency plan and help identify deficiencies and recommend solutions to further enhance the response to those people directly affected by the event.

Exercising is about communicating, realistic problem solving and principally ensuring that the plan outlines the best procedures to take care of emergency victims and their family and friends. Exercises and training programs build trust and recognition between all participants from the planners to the responders. It is a rehearsal for the real thing.

When an emergency plan is developed, completed and then distributed to staff, its useful life will be limited without constant amending and testing. Exercises and training are the critical link between the plan and the people carrying it out. The plan that is most valuable in an emergency, is the plan that has been exercised by staff and which will be

implemented as second nature once an event occurs.

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This article has been refereed

# Victorian flood conference set for Traralgon in October

The next Victorian Flood Management Conference is being held in Traralgon from 10–12 October 2001. The conference, which is held only once every two years, is being hosted by the West Gippsland Catchment Management Authority and Latrobe City Council.

The theme for the conference, *Planning for the Inevitable*, is intended to highlight the importance of **planning** to good floodplain management. Flooding is somewhat unique in the world of natural disaster management in that it is highly predictable—we can estimate locations, extents and depths of flooding with considerable certainty—we just don't know when floods are going to occur. However, floods are **inevitable** and proper planning is critical to minimising their negative impacts and the associated social trauma. With the introduction of new and consistent municipal planning schemes across Victoria, and the advent of Catchment Management Authorities with regional floodplain management functions, planning for floods has a renewed focus and vitality.

Sponsors and technical papers are currently being finalised and a second conference brochure will be distributed in early July.

To be placed on the mailing list for conference information contact:  
Wayne Gilmour, Chairman of the organising committee  
Phone: 03 5175 7800, email: wayneg@wgcm.vic.gov.au

# Mir emergency management:

## National arrangements for managing public safety aspects of the re-entry of the Russian Mir Space Station

### The Mir space station

At 4:59 pm Australian Eastern Daylight Saving Time on the 23<sup>rd</sup> of March 2001, the Russian Mir space station plunged safely into a remote and uninhabited area of the Pacific Ocean, midway between New Zealand and Chile. This seemingly uneventful operation was the culmination of months of concentrated effort on the part of the Russian Aviation and Space Agency (NASA), directed at executing a dignified conclusion to a significant era in Russian Space exploration. Notwithstanding, had the Russian plans gone awry, a large proportion of the world's population may have been placed at risk through the impact of re-entering debris. Accordingly, many nations, including Australia, saw fit to develop emergency management arrangements appropriate to this risk.

Mir, meaning 'peace' in Russian, was launched in February 1986 and was intended only to spend about three years in space. However, with the addition of further modules, Mir's stay in space was extended a further 10 years, playing host to 28 long-term missions, conducted by 106 astronauts. In addition, almost 17000 experiments were conducted aboard Mir, providing a wealth of scientific knowledge. By February 2001, Mir weighed around 137 tonnes and measured 33 metres along its longest axis. Mir orbited around the Earth at an altitude of around 400 kilometres, every 92 minutes and between the latitudes of 51.6 degrees North and South.

### De-orbit

In late 2000, Emergency Management Australia (EMA) became aware of the Russian Government's intention to de-orbit Mir. Based on EMA's experience in late 1996 with the failed Russian Mars Space Probe, which threatened to impact on Australia, and discussions with other Commonwealth agencies, it soon became evident that the de-orbit of Mir could place Australia at some level of risk. What followed was four months of planning at a level of intensity matched only by preparations in 1999 for the Year 2000

by Mark Sullivan and Rod McKinnon

(Y2K) computer date change. Indeed, many of the lessons learnt during the planning for Y2K were valuable in planning for the re-entry of Mir.

There were three main phases to the Russian plan for the de-orbit of Mir. The first was to dock a Progress rocket containing 2700 litres of fuel to Mir in late January 2001. The second was to allow Mir to descend naturally to an altitude of 220 km. The third was to apply braking impulses using the thrusters of the Progress rocket to slow Mir to enable it to adopt the desired re-entry orbit.

### Stakeholder identification

EMA was given the lead role of coordinating national arrangements to manage the risks to of public safety in the remote possibility of debris falling onto Australia. EMA's first task was to identify the stakeholders. These included each State and Territory, as well as a large number of Federal Government agencies. It was important to engage stakeholders from the outset, as they needed to have ownership of any arrangements that were to be put in place for managing any impact of Mir on Australian territory. In addition to considering the needs of our own country, it was also deemed important to ensure our South Pacific neighbours were apprised of the situation. This was effected through the Department of Foreign Affairs and Trade.

At the same time that stakeholders were being identified, a draft contingency plan was developed, briefing material for meetings prepared, and speaking points for media interviews formulated. These documents were evolutionary. Hence, a great deal of flexibility needed to be incorporated into them. This flexibility was invaluable during what was to become a constantly changing information environment.

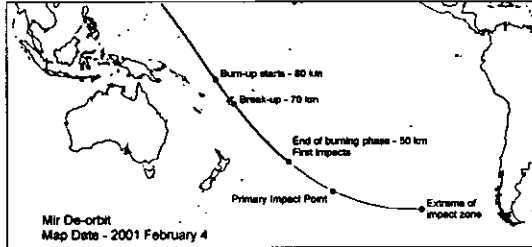
A central objective identified during

initial planning was to place an Australian liaison officer in the Mir Mission Control Centre (MCC) outside Moscow. At the time this idea was first mooted, it was perceived by many as an admirable but far-fetched proposition. Fortunately, this proved not to be the case, with an Australian representative present in the MCC and in continuous telephone contact with EMA throughout the re-entry. The representative showed extreme dedication in ensuring the passage of real-time information to the National Emergency Management Coordination Centre in Canberra. This enabled all Australian stakeholders to be apprised of developments as they occurred which was vital to EMA's ability to rapidly pass information to those who sought it, particularly the media for their reports to the public.

### Contingency plan

Through past experiences involving the return of space craft carrying hazardous material, there was concern throughout the planning process that Mir too might have been carrying such material. The presence of radioactive materials would have brought into play the Australian Contingency Plan for Space Re-entry Debris (AUSCONPLAN SPRED). Significant effort was therefore directed at obtaining information from a number of sources. Ultimately, an official from the Russian Embassy in Canberra visited EMA to deliver a letter from NASA stating that there were no hazardous materials on board and all fuel was expected to 'cook off' on re-entry.

At the core of Australia's planning arrangements was a contingency plan developed by EMA and containing several key elements. The first element was the formulation of a Mir National Warning Group (MNWG). The MNWG comprised representatives from all key stakeholders who were kept informed of developments throughout the planning process. The second key element was a pager network. This was used to relay real-time messages to the MNWG during re-entry as soon as new information became available. Each of these messages was confirmed by



above: the Mir space station and its planned de-orbit trajectory

facsimile. Finally, the contingency plan contained a set of operational procedures for dealing with the re-entry and possible impact on Australian territory, supplemented by maps and technical information on aspects such as the fuels used by Mir.

### Information management

In addition to the contingency plan, EMA's media liaison officer prepared a media management plan. This ensured that accurate information was disseminated to the Australian public through media channels in as timely a manner as possible. As EMA was the official point of contact for Mir-related issues within Australia, it was important to have the latest and most accurate information delivered in such a way as to avoid misinterpretation and panic. Accordingly, media briefs were prepared on a continual basis, fact sheets were developed, and a National Media Centre was established at EMA. Some 350 media calls and requests for interviews were fielded by EMA in the three days leading to the re-entry on 23 March. This enabled EMA to work with the media to reach the public with accurate information—a strategy applauded by media representatives.

Information management comprised a significant portion of EMA's activities. One of the most valuable tools for keeping stakeholders informed was a weekly situation report that was emailed to each stakeholder. This was well received and often served as the basis for similar information being passed by them to their respective organisations. Situation

reports were issued to stakeholders on a daily basis during the week prior to Mir's re-entry.

The World Wide Web (WWW) played a crucial role in satisfying many of the information needs at all stages of the process. In the early stages, the WWW provided many useful sources of background information on Mir ranging from the history and construction of Mir to the nature of the rocket fuels

used by the engines. As the re-entry date drew nearer, the WWW was extremely valuable in providing daily trajectory reports from the MCC. These formed the basis of the situation reports which were sent to stakeholders. Although access to the MCC web site became increasingly difficult in the week prior to re-entry due to its inability to handle the massive traffic load, the use of the WWW was nevertheless an effective emergency management tool. However, on a cautionary note, information obtained from the WWW was not taken for granted and wherever possible, it was validated through the Australian representative in Moscow.

### Conclusions

The re-entry of Mir presented Australia's emergency management community with an opportunity to once again test emergency management arrangements and, more importantly, further enhance the diverse network comprising that community. However, the principal benefits of such occurrences are invariably the lessons learned which can be applied to similar events in future. Based on feedback from stakeholders, the following were assessed as being some of the more important lessons:

- The planning sequence for the Mir re-entry reaffirmed that, provided Australia maintains disaster management networks at the level we currently enjoy, planning for specific national events can occur efficiently and effectively.
- The benefits of a flexible plan were apparent in a continuously changing environment.

- The concept of having a person in the Mission Control Centre was well-received and effective.
- Early stakeholder identification had a positive effect on planning and preparedness.
- The national meeting conducted early in the planning process was highly valued as a source of technical background and relevant contacts.
- The concept of a pager network worked very well and should be considered for future emergency events.
- A comprehensive media/public awareness plan is essential.

It could be said that the re-entry of Mir simply precipitated an exercise in preparedness within the Australian emergency management community. This is, to an extent, a valid statement. However, when prevention is not an option, and mitigation efforts are of minimal utility, preparedness efforts are the only options left open to a vulnerable community. The extent to which preparedness efforts were undertaken by all agencies is testament to a national emergency management system committed to maximising the safety and well being of the Australian community. All involved in planning for the re-entry of Mir embraced the task at hand with selfless dedication, backed up by proven emergency management concepts and arrangements. Australia's response to the Mir re-entry was truly a team effort and EMA would like to express its sincere gratitude to those State, Territory and Commonwealth agency representatives involved for their stalwart efforts. Moreover, it is heartening to see that, in a country that is susceptible to many hazards, our emergency management arrangements, and indeed the personnel who develop and execute these arrangements, are up to the challenge of addressing such unique occurrences as the re-entry of Mir.

Finally, the efforts of the Russian Federation cannot be ignored. The de-orbit of Mir safely and on target was a significant achievement and must be hailed as a success. EMA would like to acknowledge the information, cooperation and assistance afforded by the Head of the Russian Aviation and Space Agency, Mr Yuri Koptev, and his staff throughout the de-orbit operation.

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# Economic costs of natural disasters in Australia

## Introduction

The risk of natural disasters forms a backdrop to our everyday lives. Depending on where we live, floods, bushfires, cyclones and earthquakes are threats to both property and lives. Over time, communities have developed organised responses to the threats posed by natural disasters. Although preparation and response measures can mitigate their effects, natural disasters continue to occur and cause severe damage.

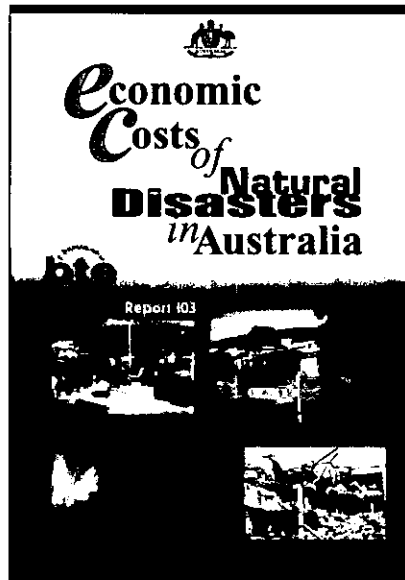
This article summarises the findings of a recently released report by the Bureau of Transport Economics, which examined the economic costs of natural disasters in Australia for the 1967 to 1999 period. The Bureau also brought together work by others on loss estimation methods to develop a consistent framework for use in estimating the future costs associated with natural disasters.

Although scientific understanding of natural disasters in Australia is of a high order, very little work has been undertaken on the economic effects of disasters. The report arose out of a need to put the value of mitigation expenditure on a sounder footing than had previously been the case. In response to the need for better cost information, a working group (the Disaster Mitigation Research Working Group, chaired by the Department of Transport and Regional Services) was established to oversee the project. The working group comprised representatives from Commonwealth, State and Territory, and Local Governments, the Insurance Council of Australia and the New Zealand Government. The research was endorsed by the National Emergency Management Committee (NEMC).

The objectives of the project were to establish the costs of natural disasters in Australia over time, to examine the trends in these costs and to develop a model for estimating the costs of future disasters. The research is part of a longer-term project to look at mitigation measures in more detail.

The term 'natural disaster' covers a wide variety of disaster types. For the purposes of the project, a natural disaster was classified as any emergency defined by the Commonwealth for the purposes of the Natural Disaster Relief Arrangements (NDRA). As a result of this classification, the analysis was limited to floods, storms

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*A report by the Bureau of Transport Economics that sheds new light on the costs to the Australian community of natural disasters.*

(including hailstorms), cyclones, tsunamis, storm surges, bushfires and earthquakes. Landslides were also included, as they are in the NDRA when they are consequential to an eligible event.

The focus of the study was national economic costs. A national approach was necessary to achieve the project's objectives. A local or regional approach may be more appropriate for an assessment of individual disaster mitigation measures. An economic, rather than financial, approach was chosen because economic analysis is concerned with the broader social effects of a disaster on the whole community. A financial analysis is concerned with the financial impact of a disaster on individuals and enterprises affected.

The impact of a disaster can be devastating for businesses and communities directly affected. However, economic analysis has a national

perspective, rather than a local one, in order to develop an Australia-wide view of the cost of disasters. One consequence of a natural disaster might be that private or public enterprises lose business to competitors. Although the loss of business is a financial loss for the disaster-affected enterprise or locality, it is an economic loss only if the national economy is affected. Loss of business to a competitor within Australia is not an economic cost of the disaster, but a loss of business to a foreign competitor is. It should be noted that if there are additional costs incurred by the use of an alternative supplier, such as increased labour or transport costs, then these additional costs are economic costs of the disaster, as resources are consumed that could be used for alternative uses (Thompson & Handmer 1996, pp. 22-24). Further discussion on this complex issue can be found in the report.

Defining a disaster is a difficult and somewhat controversial task. Storm damage to a few houses may be disastrous for the households involved, but from a national perspective is unlikely to be thought of as a disaster. However, designating just how many properties must be damaged or lives lost before an event constitutes a disaster is necessarily subjective and mostly arbitrary. As our focus is the national economic cost of disasters, we believe the use of a \$10 million total cost threshold (excluding the costs of deaths and injuries) to define a disaster captures significant natural hazard events from an economic cost viewpoint. The implications of this choice of threshold are discussed in detail in the report, but it is important to note that a \$10 million total cost threshold means that, depending on the disaster type, events with insurance costs of just a few million dollars are included in the analysis. We believe the use of this threshold does not substantially affect the conclusions reached.

## Notes

1. The Bureau of Transport Economics (BTE) is a division of the Commonwealth Department of Transport and Regional Services. The BTE conducts applied economic research related to both transport and regional service issues.

## Availability of data

Australian data used for the historical analysis were derived from a database maintained by Emergency Management Australia (EMA).

Although we consider the EMA database to be the best currently available in Australia for purposes of the project, it has limitations.

- The heavy reliance on media reports limits the accuracy of the database.
- Some of the earlier events that occurred in Australia, especially smaller ones, are not likely to have been recorded, as they were not reported in the media.
- The method of estimating total costs as multiples of insurance costs can lead to significant inaccuracies.
- Cost estimates contained in the database were found to have not been properly indexed to 1998 dollars. However, the low inflation levels experienced over the past three to four years would have had little impact on the cost estimates.

Although the EMA database contains records dating back to the 1800s, it is only since 1967 that reliable insurance data, on which the most reliable cost estimates in the database are based, became readily available.

Therefore, records of events prior to 1967 were not included in the analysis. However, care is still required, as events early in the study period may not have been reported and recorded in the database.

## Key findings

The key findings of the report with respect to both historical and future analysis are listed below.

### Disaster costs

- Natural disasters (with a total cost per event over \$10 million) cost the Australian community \$37.8 billion (including the costs of deaths and injuries) in 1999 prices over the period 1967 to 1999.
- The average annual cost of these disasters between 1967 and 1999 was \$1.14 billion (including the costs of deaths and injuries). This translates to approximately \$85 per person per year.
- Estimated average costs were \$1.3 million for a fatality, \$317,000 for a serious injury and \$10,600 for a minor injury. The estimated total cost of deaths and injuries during the period 1967 to 1999 was \$1.4 billion at an average cost of \$41 million per year.
- The average annual cost is strongly influenced by three extreme events—Cyclone Tracy (1974), the Newcastle earthquake (1989) and the Sydney hailstorm (1999). If the costs of these three events are removed from the calculations,

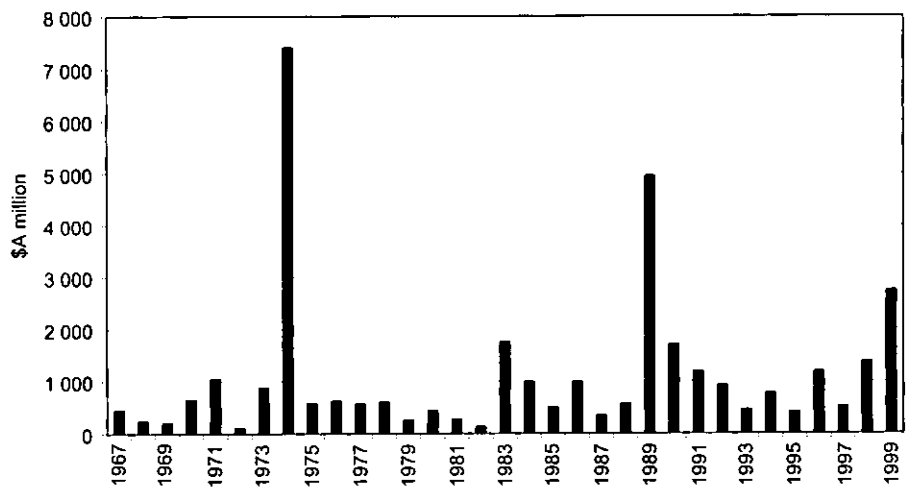


Figure 1: Annual total cost of disasters in Australia, 1967-1999 Source: BTE analysis of Emergency Management Australia (EMATrack) database (unpublished).

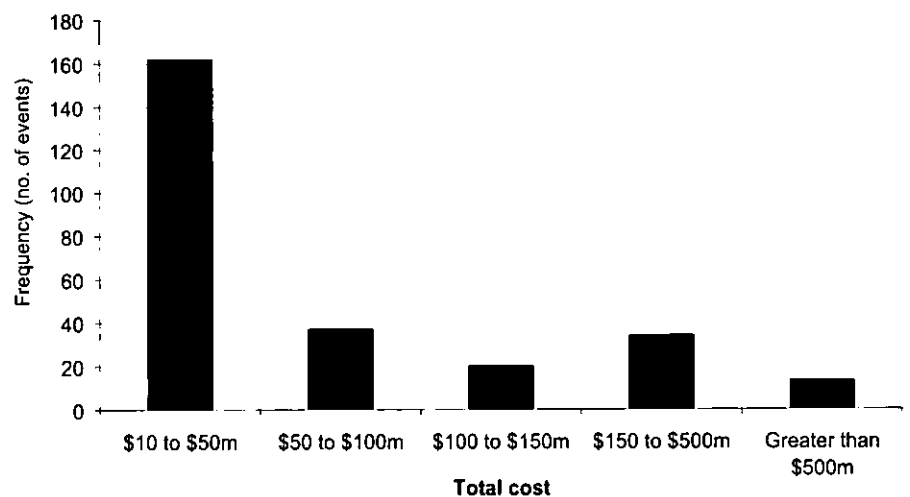


Figure 2: distribution of disasters by cost, 1967-1999 Source: BTE analysis of Emergency Management Australia (EMATrack) database (unpublished).

the average annual cost declines to \$860 million. This may be a better estimate of the costs of disasters that can be expected in a year in which extreme events do not occur.

- The annual cost of disasters is highly variable *figure 1*, standard deviation \$1.5 billion). The annual cost in years in which extreme events do not occur can be as high as \$2.7 billion in 1999 prices. In years in which extreme events occur, the total cost can be much higher. As a result, it is not possible to assess whether the annual cost is increasing or decreasing over time.
- There is no evidence in the data that the total cost of smaller and more frequent events (less than \$10 million total cost) exceeds the total cost of large rarer events. For a selection of sample years, these smaller events are estimated to have accounted for an

average of 9 per cent of total economic costs of disasters.

### Numbers of disasters

- There have been 265 natural disasters costing more than \$10 million each during the period 1967 to 1999.
- The total cost of most disasters is between \$10 and \$50 million. *Figure 2* shows that more costly events are much less common. Despite the large number of events in the \$10 to \$50 million range, the sum of total costs of these events remains small (around 10 per cent of total cost) in comparison to the cost of the infrequent extreme events. (Again, it is worth bearing in mind that many smaller disasters go unrecorded).
- There is some evidence that the annual number of events considered to be disasters is increasing *figure 3*) due partly to better reporting in recent years and possibly to increasing population in vulnerable areas.

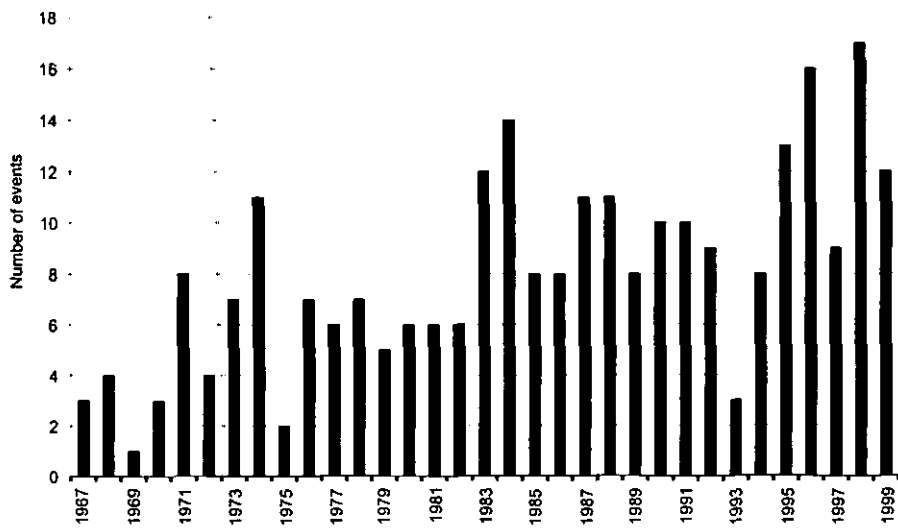


Figure 3: Number of natural disasters in Australia, 1967-1999 Source: BTE analysis of Emergency Management Australia (EMATrack) database (unpublished).

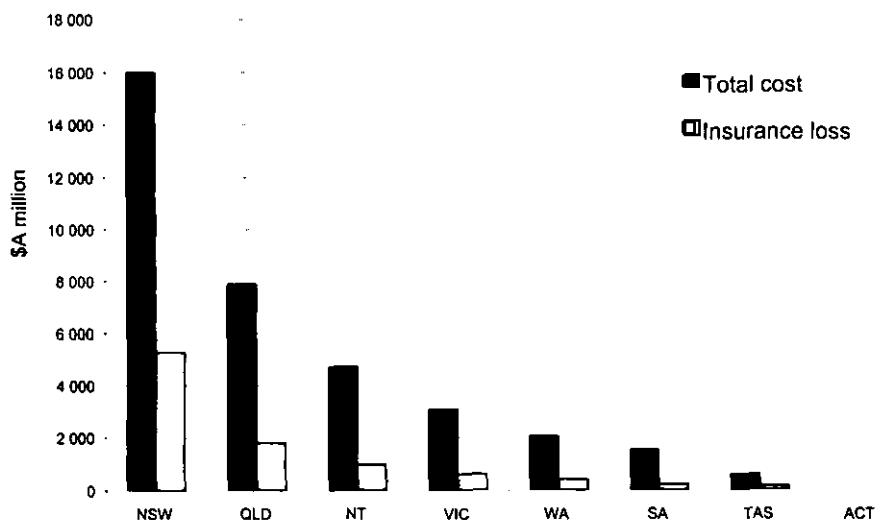


Figure 4: Disaster costs by State and Territory in Australia, 1967-1999 Source: BTE analysis of Emergency Management Australia (EMATrack) database (unpublished).

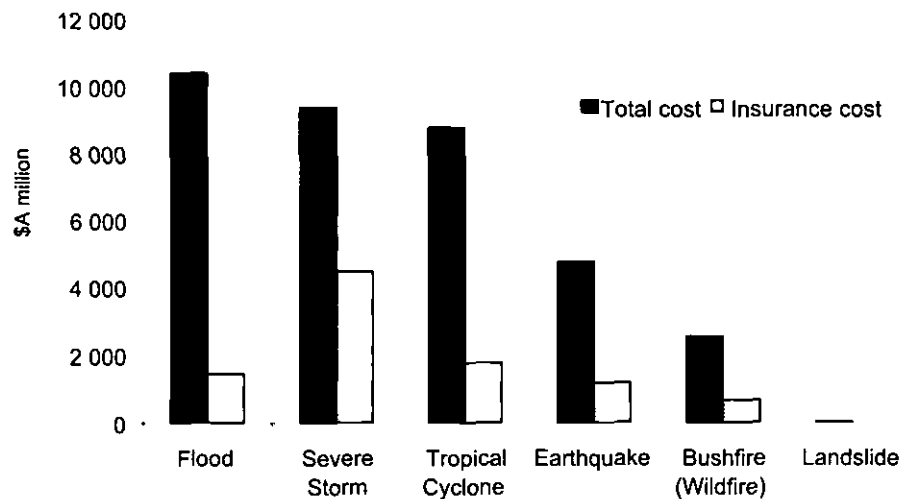


Figure 5: Total and insurance costs by disaster type, 1967-1999 Source: BTE analysis of Emergency Management Australia (EMATrack) database (unpublished).

### Regional findings

- New South Wales and Queensland accounted for 66 per cent of total disaster costs and 53 per cent of the total number of disasters over the period 1967 to 1999 (figure 4). The Northern Territory ranked third in terms of total disaster costs (13 per cent), followed by Victoria (9 per cent), Western Australia (6 per cent), South Australia (4 per cent), Tasmania (2 per cent) and the Australian Capital Territory (0.02 per cent). No events were recorded for Norfolk Island or the Indian Ocean Territories (figure 4).
- Floods were the most costly of all disaster types, contributing \$10.4 billion or 29 per cent to the total cost (figure 5). Storms (26 per cent of total cost) and cyclones (24 per cent) caused similar levels of damage. Together, the combined cost of floods, storms and cyclones was almost 80 per cent of total disaster cost. They also accounted for 89 per cent of the total number of disasters. The cost of bushfires were a relatively small proportion of total disaster costs. However, bushfires are the most hazardous type of disaster in terms of deaths and injuries.

The two most costly hazard types for each State and Territory are:

- New South Wales (floods, storms)
- Queensland (floods, tropical cyclones)
- Victoria (floods, bushfires)
- Western Australia (tropical cyclones, storms)
- South Australia (floods, storms)
- Tasmania (bushfires, floods)
- Northern Territory (tropical cyclones, floods)
- Australian Capital Territory (bushfires, storms)

Table 1 gives the estimated average annual cost of natural disasters associated with the key findings. The average annual cost in the table (approximately \$1.10 billion) is less than the \$1.14 billion mentioned earlier because the costs of deaths and injuries are not included in the table.

### Findings on methods of estimation

- There is considerable variation in the methods used to estimate past disaster costs, mostly in the estimation of indirect costs.
- The use of a consistent framework for estimating cost, based on that developed in the report, can provide a better basis for assessing mitigation proposals.
- There is no simple relationship between indirect and direct costs (defined below) of a disaster. Previous disaster reports indicate that, as a broad estimate, indirect costs are usually in the range of

Average Annual Cost (\$ million)							
State	Flood	Severe Storms	Cyclones	Earthquakes	Bushfires	Landslide	Total
NSW	128.4	195.8	0.5	141.2	16.8	1.2	484.1
QLD	111.7	37.3	89.8	0.0	0.4	0.0	239.2
NT	8.1	0.0	134.2	0.3	0.0	0.0	142.6
VIC	38.5	22.8	0.0	0.0	32.4	0.0	93.6
WA	2.6	11.1	41.6	3.0	4.5	0.0	62.7
SA	18.1	16.2	0.0	0.0	11.9	0.0	46.2
TAS	6.7	1.1	0.0	0.0	11.2	0.0	18.9
ACT	0.0	0.1	0.0	0.0	0.0	0.0	0.2
Total	314.0	284.4	266.2	144.5	77.2	1.2	1087.5
Proportion of total (%)	28.9	26.2	24.5	13.3	7.1	0.1	100.0
Note	Figures may not add to totals due to rounding.						

Table 1: Average annual cost of natural disasters by State and Territory (excluding death and injury costs)  
Source: BTE analysis of Emergency Management Australia (EMATrack) database (unpublished).

25 to 40 per cent of direct costs.

- There are very few methods for the adequate estimation of intangible costs and more research is needed in this area.

### Framework for estimating costs

It was difficult to make a conclusive assessment of the trends in disaster costs due to limitations of the data. As a result, a framework for estimating the economic cost of natural disasters, which should facilitate future estimations of disaster costs, was developed. Although drawing heavily on flood literature, the framework should be suitable for use in determining the cost of all disaster types. Nevertheless, the unique character of each disaster means that the framework should only be used as a guide, rather than an exact model to determine the cost of any particular disaster.

The report includes a discussion of general principles that should be used in estimating costs. The key principles include exercising caution to avoid double counting of costs and ensuring the use appropriate economic values of assets.

### Classification of losses

Generally, the method used to estimate the cost of a natural disaster is to categorise the losses into tangible and intangible losses, which are further subdivided into direct and indirect losses. The BTE's approach (illustrated in figure 5) was to analyse the costs in three broad categories—tangible direct, tangible indirect and intangible (comprising the direct and indirect intangible cost). Direct

costs, which are the easiest to classify, are losses that result from the physical destruction or damage to buildings, infrastructure, vehicles and crops.

Indirect costs, which are more difficult to estimate, are costs incurred as a consequence of the event occurring, but not due to the direct impact.

One area of contention is the cost of disruption to business. The cost of lost business is often included in the estimated cost of a disaster. The impact of a disaster can be devastating for businesses directly affected by that disaster, and local communities can suffer as a consequence. However, when examining the impact of the disaster from a national perspective, business disruption costs typically should not be included. This is because business disruption usually

involves a transfer between producers, without a significant loss in national economic efficiency. There may be occasions when the transfer between producers involves additional costs, which would be a valid indirect cost of the disaster. Business disruption costs would be included if the event affected the nation's economy through an increase in the level of imports or a decrease in exports.

The intangible cost category attempts to capture all losses not considered as a direct or indirect tangible cost. Intangible costs are typically those for which no market exists.

These costs are difficult to estimate, as there is no systematic or agreed method available to measure them. The largest impact is normally found in the residential sector, which includes health effects, household disruption and loss of memorabilia.

Although presently available methods are generally poor at reliably estimating many intangible costs and benefits, they should not be ignored in assessing mitigation proposals.

The framework in the report provides information on appropriate methods for estimating costs and some approximate methods where more accurate (and more costly) methods may not be feasible. The suggested methods may not cover the full range of possibilities and should therefore be interpreted as a guide. Tables 2 and 3 summarise our suggested approach to estimating natural disaster costs.

The tables illustrate the major points examined in the report. However, the categories are not intended to cover every conceivable cost category. Nor will every category apply to every disaster.

Each disaster is unique. The analyst will

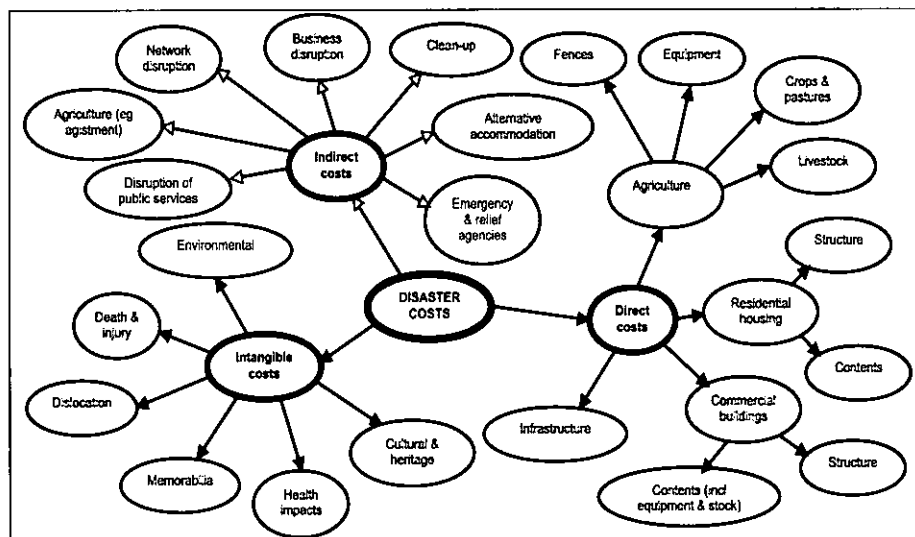


Figure 6: Outline of cost framework



Cost category	Estimation principle	Data sources
<b>Direct costs</b>		
Residential buildings—structures and contents <sup>a</sup>	Depreciated economic value	1. Survey 2. Stage-damage curves for floods 3. Adjusted insurance claims 4. \$20 500 per flood damaged residential building (Read Sturgess & Associates 2000) 5. \$23 200 per bushfire damaged building <sup>b</sup> (BTE estimate based on NSW Coroner (1994))
Commercial & industrial buildings—structures and contents	Depreciated economic value	1. Survey 2. Average unit cost based on floor area and susceptibility to floods (Smith 1994) 3. Adjusted insurance claims
Public buildings—structures and contents	Depreciated economic value	1. Survey 2. Adjusted insurance claims
Infrastructure	Cost of restoration	1. NDRA 2. Unit costs (Read Sturgess & Associates 2000)
Crops	Market value less input costs avoided	1. Survey
Pastures	Cost of restoration	1. Survey 2. Average unit costs (Read Sturgess & Associates 2000)
Fences	Cost of repairs	1. Survey 2. Unit costs (\$5000/km (Read Sturgess and Associates (2000))
Livestock	Market value	1. Survey 2. Representative values (Read Sturgess & Associates 2000).
a. Some methods give an estimate of potential flood damage. Actual damage is generally less than potential damage depending on the extent of warning given and the prior flood experience of the community.		
b. The average bushfire damage estimate is only for damaged houses and does not include houses that are totally destroyed.		

Table 2: Summary of disaster cost estimation—direct costs

Cost category	Estimation principle	Data sources
<b>Indirect costs</b>		
Business disruption	Loss of value added (usually not estimated if a national perspective is taken)	1. Survey
Loss of public services	Cost of provision	1. Service providers
Non-residential clean-up	Cost of materials plus opportunity cost of labour used	1. Survey 2. Smith et al. (1979, pp. 63-72) for commercial buildings 3. \$10 000 for public buildings
Residential clean-up	Cost of materials plus opportunity cost of labour used	1. Survey 2. \$330 per household for materials and AWE for household labour (20 person-days) <sup>a</sup>
Household alternative accommodation	Additional costs of accommodation plus any transport costs	1. Survey 2. \$53 per person plus \$26 per person-night
Agriculture	Costs such as fodder, agistment, loss of productivity due to pests	1. Survey
Transport networks	Increased vehicle operating costs. Value of time for delayed people and freight	1. Survey to estimate vehicle-hours of delay 2. Unit costs from table 4.8 in the report
Disaster response and relief	Marginal costs incurred by relevant agencies. Opportunity costs of volunteer labour.	1. NDRA 2. Survey of volunteer organisations
<b>Intangible costs</b>		
Fatalities	Human capital approach	\$1.28 million (see appendix I of the BTE report)
Injuries	Human capital approach	\$313 000 for a serious injury and \$10 500 for a minor injury (see appendix I of the BTE report)
Health effects	Days of debilitation* AWE	1. Survey 2. Average proportion affected
Environmental damage, memorabilia & cultural heritage	Ideally one of: 1. Travel cost method valuation 2. Hedonic prices 3. Contingent valuation 4. Least cost alternative <i>Otherwise proportion of direct costs</i>	Survey if one of the analytic methods is used
a. There is considerable variation in material costs and clean-up times reported in the literature. The values suggested here are representative of the reported values.		

Table 3: Summary of disaster cost estimation—indirect and intangible costs

need to decide on the basis of the nature of the event being investigated and the availability of data, which categories to include.

### A comparison of estimates

Past disaster reports were also examined using the framework developed as a benchmark for the analysis. The Nyngan flood (1990), Lismore flood (1974), Cyclone Tracy (1974), Ash Wednesday Bushfires (1983) and the Edgumbe (New Zealand) Earthquake (1988) were chosen because of the range of disaster types and their geographic distribution, and most importantly, the availability of adequate documentation.

In some cases, estimates (see table 4) were relatively close to past estimates (Nyngan, Lismore and Ash Wednesday). For others, the estimates differed widely (Cyclone Tracy and Edgumbe). The main reason for differences between estimates was the lack of availability of indirect cost information and the different treatment of particular indirect costs, such as business disruption.

### Next steps in disaster cost research

Although the cost framework developed provides some assistance in reviewing past studies, its main value is to provide a starting point for examination of the costs of future disasters. Its purpose was to provide a first step in attempting to develop a more consistent approach to measuring the cost of disasters in Australia. Historically, indirect costs—particularly intangible costs—have not been well documented and incorporated into estimates of disaster costs.

As a consequence of these limitations, the conclusions derived from the data analysis must be interpreted as indicative or approximate only, and any conclusions drawn must be regarded as tentative. In the future, improved data collections and better methods of estimating costs should lead to more reliable results.

Obtaining a more accurate cost estimate would require a system for the consistent collection of disaster costs in the wake of a disaster occurring. The current short time series of available data means that it is very difficult to come to grips with any trends, while any changes to basic data parameters may have considerable implications for the future ability to analyse trends.

It is important that a strategy for handling this issue is devised if trends in natural disaster costs are to be reliably examined in the future.

The cost framework developed was

Disaster	Previous cost estimate	BTE cost estimate
Nyngan flood (1990)	\$57.8 million	\$46.4 million
Lismore flood (1974)	\$89.4 million	\$84.1 million
Cyclone Tracy (1974)	\$4.2 billion	\$1.97 billion
Ash Wednesday Bushfires (1983)	\$975 million	\$967 million
Edgumbe (New Zealand) Earthquake (1988) <sup>a</sup>	\$373 million	\$357.7 million

a. Costs are in New Zealand 1987 prices

Table 4: comparison of past report estimates and bte estimates

cross-checked against several well-documented disasters which used differing approaches. The results were not strictly comparable.

As a result, the next step would be to test the cost framework outlined in the report in a variety of future disasters so that it can be refined to achieve greater agreement and consistency in costing Australian disasters.

The largest gap in the estimation of disaster costs is the inability to adequately estimate intangible costs. Evidence suggests that they are at least comparable with direct costs, and possibly much larger. Research is needed to develop reliable methods to overcome this gap.

There have been few extreme disaster events in Australia, so that the understanding of their costs is poor.

Knowledge of the potential cost of future extreme events can guide the development of measures to reduce their impact.

The Cities Project being implemented by the Australian Geological Survey Organisation in Queensland and Western Australia provides an excellent tool for analysing the vulnerability of communities to natural disasters.

Together with the models developed by the Cities Project of potential impacts of disasters on local communities, the methods presented in this report could provide a useful means of estimating the future costs of extreme events.

Finally, the costing of past events is not necessarily a reliable guide to the impacts of future events. More recent developments in technology and logistics can affect the scale of a disaster. For example, the greater reliance of some communities on sophisticated computer-controlled systems and just-in-time scheduling can increase the impact of natural disasters if these systems and facilities are disrupted.

Research is therefore needed on how these developments might affect the vulnerability of communities.

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# Capitalism and the shifting spatial and social distribution of hazard and vulnerability

## 'Risk society' and its others: are you feeling lucky today?

Economic, and to some extent, political globalisation has been accompanied by a lot of theory. Post-modernism can be interpreted theorising struggle by individuals, small self-identified groups, localities to maintain their autonomy in the face of huge, rapidly shifting tidal waves of capital. In their wake are pulled millions of international labor migrants—many of them illegal. Their enclaved communities are often abused by main stream cultures, at best ignored, be they Turks or Mozambicans in Germany, Algerians in France, Salvadorans, Mexicans or Cambodians in Southern California.

In the hands of some, the critique of modernism has attempted to understand the changes in society at the macro level. Such, for example, is the work of and inspired by Ulrich Beck, whose *Risk Society* (1992 [1986]) remains a major reference point. He is primarily concerned with technological hazards and the perception of these by affluent Europeans. This is the domain of nuclear power, dioxin, and mad cow disease.

It is striking that within days in February 2001, the European Union's minister of agriculture announced steps to prevent the spread of mad cow disease totaling US\$1 billion a year. Also the El Salvadoran government announced that it would cost at least US\$1 billion to rebuild infrastructure (roads, bridges, schools, hospitals) destroyed by the earthquakes of January and February 2001.

Ulrich Beck writes about a small portion of humanity. Most of us are more afraid of war-lords than terrorists. Our lives are shattered more by AIDS, tuberculosis, or malaria, than the human form of mad cow disease. The risks of crossing the US-Mexican border, where in 2000, 475 people succumbed to heat, cold, drowning, and exhaustion, are not the risks of brain cancer from cell phone use by more than 100 million nervous *Norteamericanos*. A photo in a recent newspaper showed a couple sunbathing on a beach in Spain where the body of an unsuccessful migrant had washed up. Elian, and his Haitian brothers and sisters,

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should—but for his miraculous survival—have joined the thousands who perish like the little boy in a Swiss film a few years ago that followed the travails of a rural Turkish family trying to cross the Alps.

There are truly global treats, of course, such as climate change and bio-diversity erosion. In addition, there are a number of transboundary (though not fully global) technological hazards (Linnerooth-Bayer et al. 2000). All these, however, affect different classes and groups of people very differently. The new unipolar world is such that the one remaining superpower can unilaterally decide to fling 98kg of plutonium into a looping orbit around the moon, that brought the Casini space craft back to within a few kilometers of the Earth's outer atmosphere. Plutonium was the fuel, and the craft was thus given a 'sling shot' acceleration so that NASA could further delight us with the mysteries of Saturn (and secure its future funding). A slight miscalculation could have released all that plutonium into our common atmosphere. This is the realm of risk/benefit analysis, the arrogant self confidence of science as the pretorian guard of Pax Americana et Lucrum Americanum, as thousands of protesting scientists and lay people were patiently told by web sites, press releases, and published reports.

It is time to develop a framework that can accommodate these diverse risks in an understanding of globalisation and its discontents: its promises and its contradictions. This paper makes a preliminary, tentative attempt, urged on by Hewitt's complaint (now nearly 20 years ago), that disasters are treated as though they were located OUTSIDE society, on a kind of 'disaster archipelago' (Hewitt 1983).

## Power and material interest: who's quick and who's dead?

After the 1976 earthquake in Guatemala

the word on the streets for the event was 'class-quake' because low income, indigenous people were hardest hit (Blaikie et al. 1994). In the aftermath of hurricane Andrew, women told researchers that they would like to invest more in making their homes safe, but their husbands would not let them (Enarson and Morrow 1997). In both these cases political economy is in evidence. What is at work is the role of differences in power and material interest in shaping the spatial and social distribution of risk.

Gender relations in the household embody power and perceived differences in material interest, as suggested in the example from hurricane Andrew. However, these gender relations were played out in a larger scale context: in the growth boom of south Florida in the 1980s and early 1990s, and in particular in the weak regulation of the building industry, down sizing and restructuring. This left many working class men anxious about future employment (Enarson and Morrow 1997; Peacock et al. 1997).

A series of well known international examples make clear the complex nesting of local, national, and international factors. Disasters such as the methyl cyanide leak in Bhopal, India, hurricane Mitch and its earlier foreshadowing by Fifi more than two decades earlier. Also the great loss of life in the 1988 Armenian earthquake can all be seen as having been influenced by the international division of economic and political power, national reactions to this, and local livelihoods.

The Bhopal tragedy came in the context of worldwide enthusiasm for hybrid seeds and the Green Revolution package that went with them. The national context was Indian modernisation policy that encouraged the production of pesticides for the Green Revolution in factories like the one in Bhopal. All this was super-imposed on the class and caste structure of central India, where rural displacement had led to rapid squatter settlement in cities (Shivastava 1992; cf. Perrow 1984 and Cutter 1993).

The destructiveness of the Central American hurricanes was partly the effect of displacement by agri-business of small farmers onto small subsistence farms on steep slopes with consequent

deforestation. International markets for beef, bananas, cotton, and coffee drove this displacement, while historic patterns of inequality in land access and political power absorbed and translated these forces into unsafe conditions at the local level (Comfort et al. 1999; cf. Diaz and Pulwarty 1997).

The standardised, modular, cheap apartment buildings that collapsed in Armenia were partly a result of Cold War competition that diverted resources in the Soviet Union into defence spending, as well as the centralist and technocratic nature of the Soviet state. Ineffective response to the emergency was also partly shaped by centralist control of communication as well as a cultural and linguistic mismatch between Russian-speaking officials and the Armenian-speaking population (Comfort 1999).

In none of these cases would I argue that power and material interest fully determine a disastrous outcome. Many other factors—social, technical, administrative, and legal, among others also contributed (Wisner 1993a; 1996; 1998). However, a full understanding of such disasters is impossible without taking the political economy into account.

Recent earthquake tragedies in El Salvador and the Indian state of Gujarat also cry out for analysis on complex root causes. It is not part of the human condition to be buried under a landslide triggered by an earthquake. Earthquakes happen. But the disaster follows because of human action and inaction.

In the case of the middle-income neighborhood of Las Colinas in Santa Tecla, just outside the capital, San Salvador, 400 homes were lost beneath a wall of debris from a collapsing slope above. This was not an 'act of God'. A group of Las Colinas residents and environmental groups were in court in last year (2000) to stop development on that slope and the ridge above. The judge ruled against them. A former San Salvador planner, Clarisa Rodriguez, told *The Economist* magazine that restrictions against building in high-risk areas are sometimes not enforced.

It is not an 'act of God' that no more than 10% of the multi-storey structures in Indian cities are built according to earthquake resistant norms. The earthquake didn't kill, but the buildings did. And the buildings go up rapidly with little planning and inspection in a boom economy like Gujarat's.

In El Salvador and also in Gujarat, both the poor and the middle class suffered. In both places hungry rural people have been



top: In El Salvador, many homes were lost beneath a wall of debris from a collapsing slope above. above: In Gujarat, the earthquake didn't kill, but the buildings did. (images courtesy International Federation of Red Cross and Red Crescent Societies)

migrating in search of work to cities like San Salvador, Ahmedabad, and Bhuj. They become squatters who live in makeshift dwellings in some of the most potentially dangerous areas in an earthquake. They have little or nothing to invest in making their homes safer, and little incentive because they don't own the land where they've built.

In San Salvador and Ahmedabad alike, the middle class is attracted to the rapidly growing edge of the sprawling cities (Satterthwaite 1999). Developers and contractors rush to fill this market demand, often in too much haste to observe building codes. This is where the landslide buried hundreds in Las Colinas, and where new apartment houses for Ahmedabad's salaried workers came crashing down. In El Salvador and India, rural impoverishment and crisis has led to large numbers of wage migrants crowding informal settlements in the major cities. Gujarat's booming economy has attracted landless and land poor people from all over northern and central India. Ten thousand of these nameless

laborers were killed a few years ago when a cyclone came out of the Arabian sea and hit flimsy shanties where they lived near the ship breaking and scrap metal industries.<sup>1</sup>

To summarise: economic and political power—and their interactions—are critical for understanding and preventing future disasters.

### What good is political economy?

Having worked for some years in projects that have exposed me to the daily routine of planners and risk managers<sup>2</sup>, I hear a question. 'Why should political economy interest the natural hazard and disaster management community?' There are two levels of answer. I will first deal with that routine practice as I have seen it in various parts of the world. Later I will

#### Notes

1. Details and references to events in Gujarat and El Salvador are available on RADIX, a web site dedicated to 'radical interpretations of disasters and radical solutions': [www.anglia.ac.uk/geography/radix](http://www.anglia.ac.uk/geography/radix)

2. Earthquakes and Megacities Initiative (EMI): [www.megacities.physik.uni-karlsruhe.de/](http://www.megacities.physik.uni-karlsruhe.de/)

speak more generally about why an understanding of economic and political power is essential for people, for Aristotle's 'political animals', and not just managers.

A first important reason is that implementation of ideas about mitigation and prevention has to take place in existing economic and political circumstances. Both national and local initiatives succeed or fail to the extent that they are compatible with existing patterns of power and material interest. Consider as an example a refinery complex recently acquired in a merger by a large holding company. This company has borrowed heavily to pay for the merger. They want to cut costs. These same executives want the restructured refinery to appear more efficient so that its stock value increases and their personal wealth in executive stock options grows. Employee downsizing is the key to cost reduction and the short-term appearance of efficiency. The refinery in-house fire brigade is eliminated. Fire fighting is now the responsibility of the local-city and county. Maintenance is also cut back. Small fires are more frequent and there is the danger that they will not be contained quickly. Low income immigrant residents adjacent and down wind of the refinery are concerned but have less political voice than the absentee owners of the holding company, who make large campaign contributions to politicians.<sup>3</sup>

Nothing described above is illegal, at least not in the United States. Politicians, holding company executives, refinery managers share a common belief in growth, efficiency, and de-regulation—key concepts of neo-liberal ideology. In order to mitigate risks in this situation, either a 'win-win' solution has to be sought within the limits of the refinery's newly defined 'bottom line', or the nexus of power and material interests has to be questioned, and with it the ideology that limitless growth, narrow definition of efficiency, and minimum regulation are good.

This is where one has to begin to use the 'C' word. One has to ask how capitalism, as a manner of organising power and material interest, has changed over past hundred years or so. What are the characteristics of capitalism today that contribute to an uneven spatial and social distribution of risk?

### **Neoliberalism: on the dangers of the greed**

In the early part of last century capitalism was characterised by a more positive

relationship between production and improved quality of life. Since roughly the period when Henry Ford invented his factory system several changes have eroded the fit between capitalism's functioning and quality of life. I want to argue that these same changes in the nature of contemporary capitalism make it more difficult to come up with 'win-win' approaches to hazard mitigation and the use of market mechanisms to provide incentives for self-protection by the working class.

Here are some of the principle characteristics of what Pope John Paul has called 'savage' capitalism, what others term 'global', 'foot loose', 'post-Fordist', 'wild', 'rampant', 'triumphant', and 'predatory' (Korten 1995; Mander and Goldsmith 1996; Corbridge et al. 1994; Harvey 1982 & 2000) and what the UN Institute for Social Development Research has called, 'globalisation with a human mask' (UNRISD 2000).

First, many workers today are not able to consume the goods and services they help to produce for export or for their own country's upper middle class and elite. At the extreme, there are many rural people in the world who produce food and fiber for the world market, but are unable adequately to feed themselves. The young women making Nike shoes in Vietnam will never save enough to own such footwear themselves. In the US and parts of Europe, global competition, industrial downsizing, out-sourcing, the rise of the service economy and de-unionisation have combined to increase the number of temporary, part-time, and minimum wage workers (Chossudovsky 1997; Sassen 1998).

Second, the link between capitalist production and general well being has been severed by the growth of military and luxury production. The percentage of capitalist production devoted to such 'waste' has increased since Henry Ford's day, accelerating during the Reagan/Thatcher/Kohl cold war end game. Workers can't get to work in Trident submarines or B-1 bombers, and fur coats don't trickle down (O'Connor 1994; Daly and Cobb 1989).

Third, contemporary capitalism is committed to maximising growth irrespective of negative long term environmental consequences. The U.S. still has not ratified the Kyoto accord on greenhouse emissions. In fact, it scuttled global warming negotiations recently in the Hague and Oslo. In the United States and much of Europe development continues to eat away at peri-urban land. Growth

without regulation seems to have become a core value (Daly and Cobb 1989; Jaeger 1994; Sachs 1999; O'Connor 1994; Durning 1992). One insightful study of this process in El Salvador juxtaposes 'sterile growth' with 'development', meaning human or social development (Rubio, Arriola, and Aguilar 1997).

The consequences for hazard mitigation of these trends are numerous. First, overseas, where predatory foreign and national capital rapidly deplete forest cover, drill for oil, delve for minerals, set up sweat shops and plantations for cheap exports, the workers and rural people are faced with vast environmental destruction, insecure, low wage jobs, hazardous working and living conditions. It is the rare Third World state that has been able to contain the negative effects of such 'growth' despite great social unrest. An indirect, but important, consequence for the US is that a large proportion of aid money that could have gone for sustainable development overseas is absorbed by disaster foreign assistance (Bales 1999; Reed 1996; Johnston 1997, UNRISD 1995 & 2000).

Second, in the US, growing polarisation between the rich and poor (including many immigrant workers) means that community based approaches to mitigation will find it more difficult to get representation and volunteer activity from the least affluent and marginalised end of the income distribution. Even the middle class is working harder according to Harvard economist Juliet Schor, and charities have noted a decline in volunteerism across the board (Schor 1996; Mander and Goldsmith 1996).

This polarisation also manifests itself in a growing urban-rural gap in income, infrastructure, access to information, and security. In the US, Australia and much of Europe agribusiness corporations are squeezing out multiple generation family farmers because of the former's scale, access to capital intensive technology, and vertical integration. As rural population declines, rail trunk lines are being eliminated. Rural exodus is fed by a vicious cycle that includes eroding access to health care by an aging family farm population, closure of schools and public libraries, and public transportation. In the US refugees from farm foreclosures end up living in mobile homes near low wage manufacturing jobs in the unionised

#### Notes

3. Example is a composite of situations encountered in the course of field work during the United Nations University project on Urban Social Vulnerability, greater Los Angeles 1998-2000; cf. Wisner (1999).

South. Mobile homes are notoriously unsafe because of the location of trailer parks in flood plains in the United States and because of their instability in high winds (Steinberg 2000, pp. 90-96 & 106-8).

As a result of the growth of agribusiness in some regions and 'globalised' non unionised manufacturing in other rural regions, very complex new problems emerge from an industrial ecological point of view. In terms of acute, sudden chemical accidents, one study of nearly 2,000 accidents reported to United States' Environmental Protection Agency from 1994-99 shows that about 12% occurred in farm supplies wholesalers, poultry processing, refrigerated warehousing and storage facilities, and animal slaughtering (Kleindorger, Feldman, and Lowe 2000: Table 6 [http://opim.wharton.upenn.edu/risk/epi\\_download.html](http://opim.wharton.upenn.edu/risk/epi_download.html)).

Third, the economically marginalised are unlikely to be able to respond to incentives (e.g. lower insurance rates, subsidies) for retrofitting their residences (Mileti 1999).

Fourth, much of the growth taking place world wide and in the US in particular is perverse. That is, it is growth that does not increase general welfare in the long run. Addition of the 'n-th', incremental shopping mall, multiplex cinema, golf resort, office park creates profits for a few, distraction for some, stress for many, and planning nightmares for those concerned with transportation, evacuation, other infrastructure, service provision and open space. Much critical infrastructure is already under-maintained due to cut backs in public finance at many levels. Sprawl adds new infrastructure in need of future maintenance, without which it may collapse or malfunction in an extreme event (Durning 1992; Abramovitz 2001; Burby 1998; Godschalk 1999; Mitchell 1999; Ayres and Weaver 1998; Inoguchi et al. 1999; Weizsaecker et al. 1997).

One of the most important ways economic globalisation is redistributing risk is via international and internal migration. For example, in the Pico Union district of the City of Los Angeles there are several thousand indigenous Maya from Guatemala, many of whom do not speak Spanish, let alone English. They are fugitives of the genocide against rural people during the worst of Guatemala's civil war in the 1980s. They live in crowded and poorly maintained tenements and work in sweatshops that manufacture clothing. Most are undocumented immigrants. They are an invisible and relatively powerless group of human beings caught in the gears of a complex

mechanism that links US historical support for Central American oligarchies and their military forces with neo-liberal regimes of accumulation. These people are highly socially vulnerable to a variety of health hazards and also earthquake and building fire<sup>4</sup>.

Gujarat provides an example of how internal migration affects the social and spatial distribution of risk, and how economic development creates such migration flows<sup>5</sup>. This Indian state is an economic power house. As such, one sees there in microcosm the enormous gap between rich and poor that characterises India itself, and the world. Much of this economic growth is linked to global markets. Its successful economy has come at the cost of having to accommodate somewhere a very large population of unskilled labor. These people have migrated there from all over northern India because their lives as landless laborers elsewhere were untenable.

Gujarat is to be the major beneficiary of the water diverted by all the dams on the controversial Narmada river system (see Arundhati Roy's passionate little book, *The Cost of Living* 1999)<sup>6</sup>. It needs this water for irrigation in an attempt to anchor the livelihoods of some desperately poor rural people in its hinterland who have not benefited from the state's economic growth. If it doesn't do something like this, they, too, will move to the cities whose names we are reading in news accounts of the earthquake (Bhuj, Ahmedabad). My guess is that already over the past few years these towns have been sprouting hutments, encroachments, and squatter settlements for this precise reason.

But rural crisis and exodus has long been the by-product of 'modernisation' and 'growth' in India. The original green revolution of the mid 1960s introduced hybrid seeds and packages of practices and inputs for their use that pushed small farmers off the land, which was then accumulated by larger farmers. Farm production grew impressively, but the winners were urban people with purchasing power, not the dislocated rural poor (Shiva 1989; Dreze 1990).

Another 'push' from the countryside into these towns—this perhaps more speculative, but based on inference from other border situations—is that Indian army defensive operations near the border with Pakistan may have disrupted already fragile livelihoods.

Finally, one must consider the cultural as well as economic and political situation of the tribal (adavasi) people in India

generally and in Gujarat in particular. Many of the people who may have been losers and not winners in the growth stimulated by globalisation, especially in the isolated northern parts of Gujarat, where the shaking was most extreme, are ethnic minorities. They have received very few government services over the years, tend to be displaced by so-called development projects, and often end up among the poorest of urban squatters when they are displaced.

### **Nasty, brutish and short: is there an alternative?**

What alternatives are there? First, as I suggested earlier when imaging the objections of 'managers' I respect, one can try to work within the existing capitalist order, showing corporations where their interests overlap with those of the general public. One can also try to work with marginal economic groups using innovative tools such as micro-credit for home and community safety improvements. This is similar to the approach of FEMA's Project Impact, the Inter-American Development Bank, and some NGOs in Latin America and India, as well as the approach in much of Europe, Australia and New Zealand, and the urban-industrial enclaves of Asia and the Pacific (IAB 2000).

It is the approach that underlies the creation at the end of the International Decade for Natural Disaster Reduction (IDNDR) of the ProVention Consortium by the World Bank<sup>7</sup>. ProVention's concerns range from novel and innovative 'catastrophe bonds' to assist the worldwide reinsurance industry to the use of 'micro credit' among the poor as a way of financing investments in home safety. Successes can be achieved and some improvements in public safety can result (World Bank 2001).

However, in the long run a second, complementary, initiative is necessary. Full hazard mitigation, as a mainstream part of sustainable development, is impossible without challenging the prevailing ideals of limitless growth, of ever decreasing governmental regulation, and of the dominance of market values. The broad coalition of unions, environmental groups, consumer advocates,

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#### Notes

4. Field observations, United Nations University project on Urban Social Vulnerability, December 2000.

5. See details and select bibliography on RADIX: [www.anglia.ac.uk/geography/radix](http://www.anglia.ac.uk/geography/radix)

6. Also see the report of The World Commission on Dams: [www.dams.org/](http://www.dams.org/)

churches, and other citizen based organisations present in Seattle, Washington, and Prague to protest the World Trade Organisation show that such questions are being asked widely.

Citizen and worker education about the way that power, economics, land use, well being, and safety interact can provide a growing base for those on boards of directors and those in government that realise that 'sustainable growth' is an oxymoron, and that 'sustainable development' has to do with an increase in the quality of life for all of us. Thus, an important strategic move would be to link hazard mitigation efforts to the agendas of unions and citizen based groups concerned with electoral reform, corporate accountability, and environmental justice.

A good start would be for such popular coalitions to push for a national dialogue on sustainable development as the context for recovery planning whenever a disaster occurs. Following hurricane Mitch a broad cross section of Nicaragua's citizens demanded such a dialogue. The then and present government resists such a broader democratic context for resource allocation, but such a struggle could eventually bring in an elected government more attuned to the popular will. In the post Mitch period, civil society in Nicaragua succeeded in articulating a new vision of sustainable development in that country<sup>8</sup>. For so-called 'recovery' to be anything more than the reestablishment of the *status quo ante* that make people, schools, hospitals vulnerable in first place, there must be a broader development vision. Business as usual will only reproduce the pre-conditions for yet more disasters (Susman et al. 1983; Blaikie et al. 1994; Hewitt 1996).

At this writing (February 2001), various sources<sup>9</sup> have reported that not only has the very conservative ARENA government of President Flores rejected wide appeals from citizen groups for such a national dialogue, it is moving ahead very rapidly with nothing more than 'business as usual'<sup>10</sup>. In El Salvador this means a neoliberal, dependent capitalism that has opened up the country to low wage sweatshops owned by foreigners. Public budgets that could have been used to strengthen schools and hospitals have been cut, and produced a 'pro business' atmosphere in which developers of luxury homes could go to court and get building restrictions waived. This last was one of the precursors to the landslide in Santa Tecla, outside San Salvador, on 13 January, that buried 400 homes.

Furthermore, the government has forced the early retirement of seven-eighths of its public works employees in order to clear the way to give contracts to private contractors to do the work of repair and reconstruction of damaged and destroyed infrastructure!

Imagine the captain of a life boat ordering its occupants to throw their oars overboard because, on the horizon, he thinks he sees a powerful boat coming to tow them to safety! It is neither certain that this private sector tow-boat is capable of the task, nor even that it is sea-worthy. Nor is the direction in which it might tow the whole society certain. Privatisation can bring many surprises, as California has discovered to its cost as it's energy utilities struggle with a \$12 billion debt following electricity privatisation and as Great Britain has seen with the disastrous state of its privatised railways. Such, however, is the nature of capitalism in the era of globalisation.

By contrast, according to a Citizens' Declaration, published by a wide coalition of groups in El Salvador in mid February 2001, following the third destructive earthquake since January, radically different recovery priorities appear: housing and refugee camps, employment and reactivation of the productive apparatus, and environmental and social vulnerabilities<sup>11</sup>.

The organisation responsible for coordinating the formulation of this Citizens' Declaration is FUNDE (National Fund for Development/ Fundacion Nacional para el Desarrollo)<sup>12</sup>. It is a non-profit organisation set up in El Salvador at the end of the civil war, in 1992, as a national forum for alternative thinking about human development and support of regional and local projects. It has a dense, decentralised, nation-wide network, and consults these localities as well as other networks (womens', health, etc.) when formulating the kind of declaration referred to above. FUNDE is also part of a worldwide network of 1,300 citizens' groups that have joined together to question the direction of globalisation and its impact on their lives and communities<sup>13</sup>.

This then brings us full circle, back to remarks at the beginning that one needs to look further than Beck's Risk Society. Globalisation is making the game of life more risky for many as it provides an illusion of security for some. The social and spatial distribution of risks of all kinds are changing. We must make every effort to understand these changes and to work in solidarity with civil society to

demand alternatives (Bernard et al. 1997; Pye-Smith et al. 1994; Varley 1994; Maskey 1989). The reasons, to paraphrase two fine Western authors: 'No man is an island' (John Donne), and 'It is not enough to understand the world, one must work to change it' (Karl Marx).

### **A human rights approach to disaster prevention?**

A necessary, but not sufficient, support for the demands by civil society for an alternative to the carnage in Gujarat, El Salvador in 2001, Turkey, Greece, and Taiwan in 1999, and back through the recent past, is recognition of protection from avoidable harm in extreme natural events as a human right. The foundations for such an approach have already been laid by the work of international organisations and human rights activist working on other questions (Johnston 1997; Boyce 2000; Kent, Aysan, Molin, and *World Disasters Report 2000*, chapter 8— all on the RADIX web site<sup>14</sup>).

In particular, UN agencies have provided three kinds of things so far. These are necessary, but they are not sufficient to initiate the sea change in how nations deal with natural hazards. These are: technical knowledge, support for institution building, and financial assistance through grants and loans. The missing ingredient is the kind of moral imperative that can mobilise local political will. It is when the world at large agrees to standards of responsibility by nation states toward their citizens in the form of treaties, covenants and other agreements, that this moral force is felt most strongly.

Why, then not set our sights on an international treaty that commits governments around the world to apply low-cost solutions based on available knowledge to prevent such tragic, avoidable loss?

Networks of scientists and engineers exist that could take on the technical work of defining these standards. These networks were created in part by the IDNDR—10 years of scientific exchange

#### Notes

7. [www.proventionconsortium.org/](http://www.proventionconsortium.org/)

8. CEER web site: [www.ccer.ipeople-international.com](http://www.ccer.ipeople-international.com). Also see Barraclough and Moss (1999).

9. Oxfam UK 15 February 2001, excerpted from Reliefweb: [www.reliefweb.int/](http://www.reliefweb.int/); CISPEs 14 February 2001, excerpted from [www.cispes.org](http://www.cispes.org)

10. See the bibliography in RADIX for background on the civil war in El Salvador and the role of this conservative political party: [www.anglia.ac.uk/geography/radix](http://www.anglia.ac.uk/geography/radix).

11. [www.funde.org/declaracion.htm](http://www.funde.org/declaracion.htm)

12. [www.elobservatorio.org/globalizacion.htm](http://www.elobservatorio.org/globalizacion.htm)

13. SAPRIN, [www.saprin.net/saprin.htm](http://www.saprin.net/saprin.htm)



mandated by the United Nations. However, this International Decade left unfinished business. Science was exchanged, but generally it hasn't been applied. Such an effort would require thousands of experts to work out the low-cost, minimum practices required to avoid further such tragedies. These scientists and engineers would have to sit down with lawyers, legislators and policy experts to work out how the minimum standards would be enforced.

This is not an impossible task. It has happened before. One recent example is the exchange among hundreds of agencies that work in humanitarian and disaster relief that led to agreement on a very detailed set of minimum technical standards for relief. Known as the SPHERE project<sup>15</sup>, its published document covers food, water, shelter, health care, and many other aspects of relief.

There are also many internationally agreed safety standards for the chemical industry, airline industry, nuclear power industry, etc. It has happened already where global warming is concerned. The Inter-governmental Panel on Climate Change (IPCC)<sup>16</sup> has mobilised thousands of scientists, and their work has gone into the treaty-making process that led to the Kyoto Accord on greenhouse gas emissions.

Could the UN not create a parallel Inter-governmental Panel on Natural Disaster, that would, in a similar way, act to mobilise existing knowledge and feed it into a treaty making process? Such a body is necessary because so many different kinds of knowledge and expertise is required. No single existing specialised agency of the UN such as UNESCO, UNEP, WHO, or WMO covers all the specialist knowledge that would be required. That is one of the reasons that the IPCC was created. Preparing for the impacts of global warming requires many kinds of knowledge from areas such as public health, economics, agriculture, oceanography, in addition to expert understanding of world and regional climates.

What would be done during the many years that such a treaty would be in the making? The beauty of this process is that the low-cost solutions will filter out into society. Citizens groups will demand action by their governments, as they did

in Turkey when it became clear that contractors hadn't followed building codes and had used low quality materials. Or in South Florida, in the USA, when it came to light that poor construction methods were responsible for much avoidable damage in hurricane Andrew. Prevention of disasters has to come from the bottom up as well as from the top down (Harvey 2000; Platt 1999; FEMA 1997; Alexander 2000; Kirby et al. 1995; Wisner 1995; 1993a & 1993b).

Absolute safety is not a human right. Safety from avoidable loss, injury and death is. Nothing in the Universal Declaration of Human Rights makes much sense if the human beings who are supposed to enjoy these rights can be snuffed out because a government neglected to enforce its own building codes.

More information on a rights-driven approach to disaster prevention is available at: [www.anglia.ac.uk/geography/radix](http://www.anglia.ac.uk/geography/radix).

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**This article has been refereed**

# Book Reviews

## **Natural Disaster Mitigation in Drinking Water and Sewerage Systems: Guidelines for Vulnerability Analysis**

Published by Pan American Health Organization  
1998, 86 pp. ISBN 92 75 12250 4

Reviewed by Bob Handby  
Environmental Health Officer  
Moyné Shire Council

This book uses the experiences from disasters in Latin America and the Caribbean to provide guidelines for emergency preparedness and response programs for companies and authorities which manage water and sewerage schemes.

The emergency plan for these services is based on a vulnerability analysis followed by measures to improve structure of the scheme to improve reliability and a plan to mitigate or reduce the impact of the disaster.

Although focusing on sewerage and water supplies which have been identified as services essential in a disaster and which have a potential for major public health significants, the principles discussed in the book are relevant to any large industry or authority for example, those providing power, gas or communications.

The book suggests a process, which includes a vulnerability analysis of the system and a hazard analysis. Vulnerability is described as the probability that an event will occur and the likely affect on the system.

The planning process is designed to improve the capacity of an emergency response and protocols for routine operation. It is suggested that an Emergency Committee be formed to draft a response plan. This committee should have representation from the highest level of management. The committee should prepare a plan considering the vulnerability analyses, the plan should be up to date, simple and practical, it should include training of key personnel and testing with simulated exercises.

The basis for a vulnerability analysis should include identification of hazards and possible damage to components. Natural hazards including earthquakes, hurricanes, floods, landslides, volcanoes, droughts and fires should be considered.

The vulnerability Analysis requires knowledge of the system, its operation as well as potential hazards to the system.

The information contained in the book is concise and easy to follow; it is a valuable resource for industries or authorities it is designed to assist. Recent disruptions to the gas supply in

Victoria highlights the need to have emergency plans in place. Authorities such as water authorities, which manage both water and sewerage systems should find this booklet very interesting and useful. Authorities and companies with emergency plans should also satisfy themselves that services that they depend on for example, power supply also have developed an appropriate plan.

The book is not designed for persons working in the field during an emergency; it is a book to assist with pre-emergency planning.

An emergency planning approach using the vulnerability analysis detailed in this book should be an effective means of reducing the effect of a disaster.

This publication can be obtained at PAHO Online Bookstore: <http://publications.paho.org> (a secure ordering site) or through the PAHO Distribution Center:

[paho@pmds.com](mailto:paho@pmds.com), Fax: 301 206-9789  
PO Box 27, Annapolis Junction, MD 20701-0027, USA. US\$ 22.00. Order Code: OP 132.  
[http://publications.paho.org/english/moreinfo.cfm?Product\\_ID=584](http://publications.paho.org/english/moreinfo.cfm?Product_ID=584)

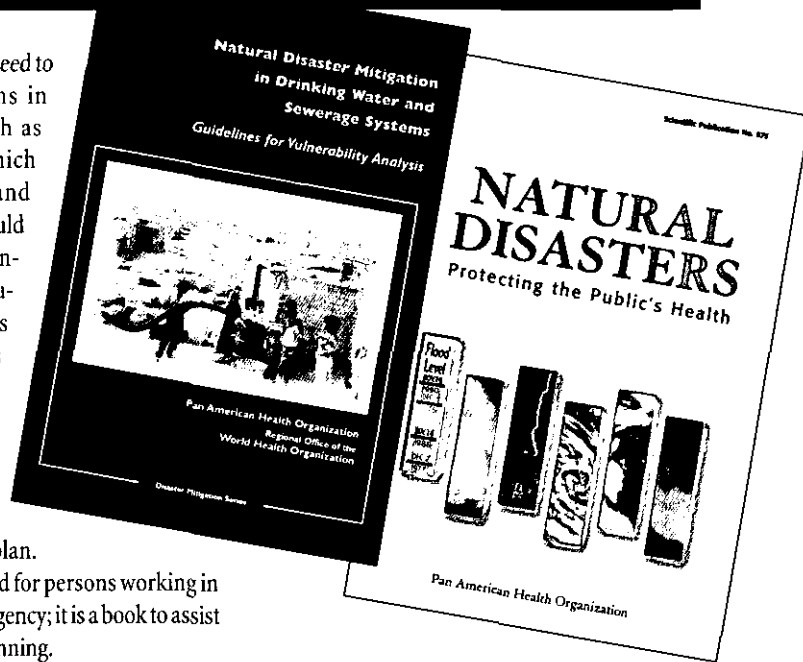
*Bob Handby is an environmental engineer with a diploma in Public Health. He works for the Victorian State Health Department as a Health Officers and Senior District Health Inspector. Bob has been involved in this field as a Red Cross delegate for over 16 years and has been responsible for improving sanitation conditions by building pipe systems, construction latrines and educating local communities on good sanitation. Bob's work in this area has taken him to Uganda, Iraq, Fiji, Rwanda, Democratic Republic of Congo, Montenegro, Vanuatu and Indonesia.*

## **Natural Disasters: Protecting the Public's Health**

Published by Pan American Health Organization  
2000, 130 pp. ISBN 92 75 11575 3

Reviewed by Duncan Moore  
AIEH (Vic) Division Emergency Management SIG

Although the above publications deals primarily with countries in the Americas, and in management of response at an international level and



does not make reference to public health issues that will arise following a natural disaster emanating from a fire. The publications is a great resource for relevant personnel responsible for overseeing the Prevention, Preparedness, Response and Recovery aspects of Public Health Emergency Management Planning.

Many public health issues that arise are generic in nature, and will need to be addressed in any disaster. But what this publications does, is not only clarifies and reaffirms the role of relevant public health professionals in a disaster but, dispels some of the myths around public health issues, acts as an 'aide memoir' and provides information on issues that many public health personnel in Australia involved in Disaster Management may not normally consider.

In the context of this publication, public health embraces both the curative side of mass casualty and the Response and Recovery management pertaining to public health such as sanitation, food, water and shelter.

In addition to being a good resource to public health personnel, it also provides a good insight into public health issues for other disaster agencies and organisation.

This publication can be obtained at PAHO Online Bookstore: <http://publications.paho.org> (a secure ordering site) or through the PAHO Distribution Center:

[paho@pmds.com](mailto:paho@pmds.com)  
Fax: 301 206-9789  
PO Box 27, Annapolis Junction, MD 20701-0027, USA. The price is US\$22.00/18.00 in Latin America and the Caribbean. Order Code: SP 575  
[http://publications.paho.org/english/moreinfo.cfm?Product\\_ID=500](http://publications.paho.org/english/moreinfo.cfm?Product_ID=500)

# Covering disaster: a pilot study into secondary trauma for print media journalists reporting on disaster

## Introduction

'Vultures and piranhas' are just some of the names that journalists are called after reporting on stories of human tragedy. The wider community seems to become split during times of disaster—identifying with the victims of trauma and wanting to protect them from further harm whilst simultaneously indulging in curiosity and voyeurism. After all, newspaper sales do escalate after reports of disaster and traumatic events. Few people, however appear to concern themselves with the possible post-trauma impact journalists may suffer after reporting on disaster or tragedy.

In 1998 Michael Gawenda, senior journalist from *The Age* newspaper in Melbourne presented the opening address to the National Conference of *The Australian Society for Traumatic Stress Studies*. Mr. Gawenda referred to the responsibility that the media must take for the trivialisation of trauma in society. He also pointed out that the media is merely a mirror of what occurs in the wider community. Further, he raised the question of the potential impact on journalists who report on disaster, especially considering that such journalists are generally the youngest in the profession. They have no training in dealing with either grief or trauma, nor are they trained in interview techniques for distressed people.

According to Melbourne journalist, Nic Place (1992), journalists who report on traumatic incidents may well require counselling or debriefing after covering such events. Place proposed that these journalists possibly experience trauma or acute stress resulting from witnessing, and/or interviewing victims of disaster or catastrophe.

A television documentary by the Australian Broadcasting Commission's 'Four Corners' (1993) supported the view that journalists do have lasting emotional reactions after covering trauma. Journalist Barry Fox who was interviewed on this program stated, when talking about witnessing and reporting on war, 'it leaves its mark on you, and that mark stays'.

These narratives from journalists are supported by a report in *The American Journal of Psychiatry* by Freinkel,

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Melbourne

Koopman & Spiegel (1994) who found that 18 journalists present at an execution in San Quentin prison during 1976 subsequently experienced anxiety and dissociative symptoms following their viewing of the execution.

Despite these anecdotes there appears to be no Australian psychometric studies undertaken on the impact on journalists covering stories of disaster, trauma or human tragedy. The present study was undertaken as a pilot study for further research into this area of traumatology.

## Pilot Study

### Method

A mixed model paradigm was used (a synthesis of qualitative and quantitative research) using two variables 'Then' (experiences at the time of the traumatic event, retrospectively taken), and 'Now' (experiences at the time of completing the survey).

The psychometric instruments used were the General Health Questionnaire—28 (GHQ) & Impact of Events Scale (IES). These questionnaires measured somatic symptoms, anxiety/insomnia, social dysfunction, severe depression (GHQ) and intrusiveness and avoidance (IES).

The three hypotheses examined were:

- that journalists who cover trauma will have a decrease over time on each of the IES subscale scores, intrusion and avoidance
- that journalists who cover trauma will have a decrease over time on each of the four GHQ subscales, somatic, anxiety and insomnia, social dysfunction and severe depression
- that journalists who cover trauma will have a higher mean score on the GHQ subscales than non-trauma reporting journalists (contrast group).

No socio-economic, gender or age controls were applied to the initial sample of 279 subjects. The sample group came from journalists at both *The Herald-Sun* and *The Age* newspapers in Melbourne.

The survey was hand delivered to 32 journalists at *The Age* and 68 at *The Herald-Sun*. The remaining 131 surveys were sent through the internal mail systems. 21% of the surveys were returned and 57 of them were useable, with a gender breakdown of 27 women and 30 men. The age range was between 21 and 58 years old.

The two groups identified were: Trauma Group (32 n) (journalists reporting on traumatic stories in the last three years); and Contrast Group (25 n) (journalists who had not reported on trauma in the last three years).

## Results

### Types of incidents journalists reported on

Category	n
war	3
bank robberies	10
riots	11
natural disaster	13
domestic violence	15
child abuse	16
fire	16
vehicle accidents	17
rape	19
murder	23

Additional events identified by journalists were: chemical explosion, critical illness, child abductions, victimisation of disabled, false reporting of rape, police and government harassment (of journalist), and suicide attempts. However, no statistics were given as to the number of such events each journalist had witnessed.

### Description of Subjects

Table 1 shows the composition of the Trauma and Contrast groups.

### Symptom levels on the impact of event scale

Results showed that journalists did indeed experience significant levels of intrusive images and thoughts at the time of reporting on a traumatic story. They also experienced significant levels of avoidance as a means of dealing with trauma stories. There was however a decrease in overall impact scores of the traumatic event as time distance from the trauma increased. This supported the hypothesis

Age	
Trauma Group	- women – average age of 27.8 years - men – average age of 32.1 years.
Contrast Group	- women – average age of 32.2 years - men – average age of 40.6 years
Marital status	
Trauma Group	- married/de facto 22.8 % of group - single 31.6% - unknown 1.7 %
Contrast Group	- married/de facto 29.9 % - single 12.3 % - unknown 1.7 %
Length of time employed as a journalist	
Trauma Group	average 9.09 years
Contrast Group	average 16.04 years

Table 1: description of subjects

that journalist's IES scores will decrease over time.

### Mean scores and Standard Deviations for journalists' scores on the IES for 'Then' and 'Now'

	Then		Now	
	M	S.D	M	S.D
Intrusion	19.9	9.4	4.7	6.9
Avoidance	15.7	9.6	5.5	8.0
Total	35.6	15.7	10.2	14.0

Table 2 shows three comparative studies using the IES for primary victims of bushfire, bereavement and shooting.

### Symptom levels on the general health questionnaire

The GHQ-28 subscales were defined as:

- somatic = physical reactions such as headaches, stomach upsets, etc.
- anxiety & insomnia = feelings of nervousness and tension; difficulty sleeping
- social dysfunction = difficulty coping with daily living tasks and decision-making
- severe depression = feelings of hopelessness, negativity, suicide.

Trauma reporting journalists scored highly at the time of the trauma (Then) on three of the four GHQ-28 subscales, with a score of 5 or more regarded as high. The 'Then' mean scores were:

- somatic: M=7.7; S.D=4.3
- anxiety & insomnia: M=9.2; S.D=4.9
- social dysfunction: M=8.1; S.D=3.6
- severe depression: M=3.1; S.D=2.5

Though all scores decreased over time, only the anxiety and insomnia score decreased at a significant level between 'Then' and 'Now'. This result supported in-part the hypothesis that journalists

who cover trauma will have a decrease over time on each of the four GHQ-28 subscales.

The comparison between the Contrast Group and the Trauma Group on the GHQ-28 indicated that trauma journalists scored slightly higher on all of the four subscales than the Contrast group. However, the t-tests indicated that only the somatic symptom on the GHQ-28 was significantly different between the two groups of journalists, thus again supporting in-part that journalists who cover trauma will have a higher mean score on the GHQ subscales than non-trauma reporting journalists (Contrast Group).

### Correlation between descriptions of subjects with symptom levels

Results showed that older and more experienced journalists experienced higher rates of intrusiveness and avoidance at the time of reporting on the traumatic event than their less experienced colleagues. However, this same group of older reporters tended to have less anxiety and insomnia than younger journalists. Results on the GHQ-28 indicated that trauma reporting journalists

can expect to experience more physical complaints than non-trauma reporting journalists.

It was further found that women journalists reported more anxiety and insomnia than men and single journalists reported more depression and social dysfunction at the time of covering trauma than did married journalists.

It was found that 35% of trauma reporting journalists who experienced intrusive thoughts or feelings about the traumatic incident at the time of covering the story continued to experience long term intrusiveness of the event. 24% of the trauma group experiencing avoidance symptoms at the time of the event continued to experience them long term. Up to 43% of the trauma-reporting group recounted depression symptoms at the time of the traumatic incident and continued to experience these symptoms on a long-term basis as well. A large majority of the journalists surveyed experienced the intrusiveness, avoidance and depression symptoms between one and three years following reporting on the traumatic story.

Journalists were asked to comment on the types of support they would use or like to use following covering a story on disaster or human tragedy. Table 3 (overleaf) is a summary of those comments. (N = 32).

### Coping strategies

Table 4 (overleaf) summarises the comments on coping strategies after covering trauma.

A number of respondents gave multiple answers.

### Discussion

When comparing the journalist's results with those IES scores presented by Creamer et al. (1989) it is interesting to note that journalists who encountered primary victims of trauma or traumatic events for professional reasons have

### Mean scores and Standard Deviations of three trauma groups using the IES recently after a traumatic event

	Ash Wednesday Bushfire		Recently Bereaved		Queen Street Shootings - stage 1	
	M	S.D	M	S.D	M	S.D
Intrusion	19.2	9.3	17.3	9.3	11.5	8.4
Avoidance	12.6	8.0	15.0	11.4	11.4	9.0
Total	32.7	14.3	32.3	-	22.9	16.0

Table 2: from Creamer, M., Burgess, P., Buckingham, W. & Pattison, P. (1989). 'The psychological aftermath of the Queen Street shootings'. Australia: Department of Psychology, University of Melbourne.

Personal support	n	Professional support	n	Organisational support	n
Would like someone to talk to	4	Would like someone professionally trained to talk to	5	Believe that there should be recognition from management of the extent of the trauma	4
Would talk to someone at home (family & friends)	4	Would appreciate some debriefing	4	Management should offer help (rather than having to request it)	1
Would like a shoulder to cry on	2	Believe that long term effects should be dealt with	1	A changed culture where you are not regarded as a wimp if traumatised	1
Would not require anything	2	Believe that journalists should open up about it	1	Would like colleague support	1
Would like a stiff drink	1	Would speak to the Chaplain	1		
Would like some understanding	1				

Note. Four journalists did not respond to the question and a number of people put more than one answer. The results indicated that the greatest number of comments referred to a preference for a professional, family or other person to talk to, as well as having some debriefing following covering such an event.

Table 3: Types of support journalists would use or like.

Summary of responses	n
Depersonalising / don't get emotionally involved / distancing / denial / suppress thoughts / avoid thinking about it	23
Talking about it to colleagues, family, friends, anybody / debriefing	12
Valuing the job / personal integrity / remain human / cry / sympathise	12
Alcohol and other drugs	12
Black humour	6
Harden up / become cynical	1
Reading / TV / parties	1

Table 4: Summarised comments on coping strategies after covering trauma

similar scores to individuals who have been physically involved in a specific trauma such as bushfire, shooting or bereavement. This result, that 'trauma workers' are significantly impacted in their own right is supported by the findings of Berab E.F.; Jones H.J. & Valent P. (1984); Talbot A., Manton M. & Dunn P.J. (1991); Levitov and Thompson (1981); Fullerton CS., McCarrroll J.E., Ursano R.J. & Wright KM. (1992); Martin C.A., McKean H.E. & Veltkamp J. (1986); and Jones (1985), all of whom have researched the impact of professionals dealing with repeated exposure to trauma.

Whilst journalists may indeed experience significant impact from covering trauma, the high scores may also be due to the retrospective nature of the study. This may have the effect of distorting the trauma, making it more or less severe than it may have been if scored at the time of the actual incident. However Baker R.R. Menard S.W. & Johns L.A. (1989) in their study of nurses in Vietnam argued that

regardless of whether the memory accurately assessed the trauma or not is in many ways of no consequence. The recalled, or even reconstructed memory of the past trauma is relevant material for consideration and data analysis.

A further reason for the high scores on the intrusiveness subscale for the journalists may be due to the very nature of their profession. That is, journalists are required to think about and recall stories they have covered constantly, thus experiencing intrusive thoughts by nature of their work.

The fact that both intrusion and avoidance symptoms and anxiety and insomnia symptoms were the only ones that were significantly different over time may be due to these symptoms containing similar elements. That is, avoidance and intrusion are commonly used indicators of post-traumatic stress, which is classified as a psychiatric anxiety disorder (American Psychiatric Association 1987). The high scores on the IES along with the

high scores on the anxiety subscale of the GHQ indicate that anxiety is the predominant symptom experienced by many journalists after reporting on a traumatic event, to the point where further study of journalists susceptibility to post-traumatic stress disorder or acute stress disorder might be warranted.

The GHQ scores of three symptoms; somatic, anxiety and insomnia and social dysfunction over both time points for the trauma group were considerably high with each mean score above the threshold score of 5, which is regarded as a disturbingly high score (Parker 1977). This may be the influence of the traumatic incident, or it may also be attributed to other general health factors such as the lifestyle of journalists (long, erratic hours, deadline pressure), personality differences and a lack of training in trauma and stress management, or a combination of all of these. Support for multi-factorial causality may be gained by looking at the contrast group scores, which are considerably high scores in relation to Parker's (1977) threshold of 5. The somatic symptom for the contrast group is just below the threshold (at 4.2) with the anxiety and insomnia score on the threshold (at 5.2) and social dysfunction (at 6.3) just over. These scores indicate that even journalists who do not report on trauma have a notably high level of symptomology, which may support the notion that overall journalism is a highly stressful profession.

Further, the high scores of the contrast group may be due to journalist's lack of understanding of what constitutes 'trauma'. That is, the trauma and contrast groups were self-selecting, therefore it is possible that a journalist who considers themselves non-trauma reporting may actually report on trauma and be impacted without identifying it as such. A case example of this was a journalist apologising to me for not filling out the survey, as she did not think her work fitted the trauma category. This journalist reported on community issues and was often involved with refugee families who have experienced war, famine, torture, death of family members, harassment by bureaucracies, racism and deportation. In the author's opinion, these issues would indeed constitute reporting on trauma. This therefore raises a further possible discrepancy for the high scores of the contrast group.

The present research showed that there was a significant correlation between being an older and more experienced journalist and having a higher level of

intrusive and avoidant thoughts and behaviours both at the time of the traumatic event and following. This may be due to the accumulation of stress effects as noted by Singer and Davidson (1986) and Mitchell and Bray (1990). However, this same group of people in the study tended to have less anxiety and insomnia. This is an interesting relationship considering the previous suggestion that the subscales on the IES are regular indicators of elements of an anxiety disorder and one may therefore expect both symptoms to drop. The findings of the present study are supported by those of Wilkinson (1983). Wilkinson (1983) claimed that 40 year old victims of a collapsed hotel skywalk tended to acknowledge more stress symptoms than the younger people involved in the event. However the older survivors then also reported significantly lower levels of anxiety and depression.

The correlation test indicated a relationship between being a woman and experiencing more anxiety and insomnia than men. A further relationship was found between being single and experiencing more depression at the time of the trauma than married people. Whilst these results show a relationship, they cannot suggest causation. As with any correlational studies there may be unforeseen factors that may be impinging upon the variable

The reason for lack of significance regarding marital status on all but social dysfunction with any of the IES or GHQ scores is difficult to determine. Studies performed with the GHQ indeed show that marital status does impact upon these scores (Goldberg & Williams, 1988) and in the Australian study by Creamer et al. (1989) a weak relationship between these two variables was found.

However, the present findings could possibly be due to fact that trauma reporting journalists do not necessarily experience traumatic stress as a one off experience but may report on a number of traumatic incidents. Therefore those that are in permanent relationships may have partners who are used to listening to and dealing with the traumas of their journalist partners.

The open-ended questions asked of the trauma-reporting journalists regarding support following work on a traumatic story indicated that they would indeed use the opportunity to talk or debrief about the incident if it were offered. Levitov and Thompson (1981) showed through their research with police that if assistance were made available for police

to talk about their work they would also make use of it.

With respect to journalist's coping strategies following traumatic situations it was revealed that a considerably high proportion reported responses consistent with avoidant behaviour. These results were supported by the findings of McCarroll et al. (1993) of people handling bodies after violent death who reported similar strategies of those used by journalists.

### Limitations of the present study

The present paper is limited by the fact that journalists were asked to recall a traumatic story that they may have covered up to three years ago. This process may allow valuable information to be forgotten along with the individual's perception of the incident changing over time. Parloff, Waskow and Wolfe (1978) also suggested that retrospective studies may lead to various forms of response bias and should therefore be interpreted with caution.

Whilst valuable information was gathered from the information given by the journalists, the response rate of 21% certainly limited the reliability of the study.

The research instruments used ideally assess symptoms within a given time frame. The GHQ-28 measures general health and well being for up to a two-week time period and the IES measures symptoms up to seven days after a trauma. Using these measures as retrospective indicators may mean that inaccurate scores were given.

The study did not take into account other factors that may impact upon the traumatic experience of the journalists such as lifestyle and previous traumatic life experiences thus affecting the present results.

Self-report inventories give an opportunity for subjects to be untruthful or misleading in their responses. Therefore there was potential in the present study for misleading information to be given.

### Conclusion

#### Profile and Symptomology

Given the limitations listed above, it may be suggested that:

- The profile of a typical journalist reporting on trauma is a single woman of approximately 27 years of age who has been employed as a journalist for about nine years. The three traumatic incidents likely to be reported on are murder, rape and vehicle accidents. This profile is contrasted with the non-

trauma reporting journalist who is typically a married man of 40 years who has been working as a journalist for approximately 16 years.

- Trauma-reporting journalists have a significantly higher rate of somatic symptoms than non-trauma covering journalists and are marginally more susceptible to depression, social dysfunction and anxiety and insomnia.
- Journalists experiencing symptoms will have a decrease in symptoms over time.
- A journalist who experienced anxiety and insomnia will be likely to recover reasonably quickly.
- The majority of journalists experiencing intrusiveness, avoidance and depression at the time of the survey may have been experiencing these symptoms for one to three years post the traumatic event (although it is not established that the event caused the symptoms).
- Older, experienced trauma journalists are more likely to suffer from intrusive thoughts and avoidant behaviours than their younger counterparts. Yet younger journalists tend to experience more anxiety and insomnia.
- Single journalists are more likely to experience social dysfunction following trauma.
- A journalist experiencing anxiety and insomnia at the time of the survey most likely recently covered a trauma story.
- A majority of journalists would like debriefing or an opportunity to talk about their traumatic experience following covering stories of trauma, tragedy and disaster.

Finally, it can be said that the proposition of journalist Nic Place (1992), that some journalists are impacted by the traumatic stories they cover, appear to be supported by the present study. Not only do some journalists report experiencing quite serious traumata at the time of covering stories of a critical nature, it also seems that they continue to experience residual effects afterwards. Some of the symptoms they tend to experience are within the realm of post-traumatic stress and acute stress disorders.

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*This paper was the basis of a presentation given at the 3rd World Conference of the International Society for Traumatic Stress Studies, Melbourne, 2000. For further information and full statistical details contact the author: cait@netspace.net.au or phone: 0419 13 19 47.*

**This article has been refereed**

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# The role of the New Zealand Earthquake Commission

## Introduction

A fundamental duty of national governments is to house their citizens. Homelessness may be one of many issues which challenge some regimes in normal times, but after a widespread disaster it is the central concern.

Recovery of a community cannot commence until housing is found for all, even if initially temporary arrangements have to be made.

It may be thought the insurance industry can relieve this burden. Prudent home owners would surely take out a policy protecting them from the financial effects of damage from natural disasters and therefore not be callers on government assistance. In practice, disaster after disaster in the last quarter of the last century has demonstrated that the insurance mechanism does not work well for these events. Policies cost too much and are too restrictive. People choose not to purchase.

These disasters have also shown that societies will not tolerate allowing destitution and homelessness to descend on those who exercised their free choice not to purchase insurance cover. The result has been the sometimes unexpected necessity for governments, often assisted through overseas loans or charity, to provide for the housing of the majority of the victims of a natural disaster.

Following such an experience, many countries, often facilitated by the World Bank, have sought ways to manage this risk which inescapably falls to them. The New Zealand Earthquake Commission (EQC) model has been presented as an effective risk management option. In New Zealand itself, the government is investigating whether the EQC organisation can be utilised to cover a wider range of government risk.

The Earthquake Commission is becoming ever better prepared to cope with the enormous load of housing repair claims that the centralised scheme it administers will one day create. It has turned itself into a virtual corporation, takes advantage of the latest proven technology and leads the way in the collective effort vital for a community recovery.

by David Middleton, FCII, FAII, FIINZ,  
MBA Chartered Insurer,  
General Manager,  
Earthquake Commission of New Zealand

## The insurance mechanism

### Origins of insurance

Curiously, perhaps, the idea of insurance occurred, matured and expanded sometime before any coherent theory of risk management—which placed it at the end of the decision chain of risk control—was developed. This was because some methods of risk transfer, like contracting out, require a sophisticated mercantile environment which took time to develop. Risk avoidance is largely common sense (which is not to say it is universally applied), so the age of science and meticulous recording had to arrive before anyone thought to encode a theory of risk management.

It is popularly held that the insurance industry was born in China, where ancient merchants transferred goods which had to negotiate rapids in the rivers onto several craft in a strategy which a later civilisation would describe as not putting all your eggs in one basket. The practice readily transferred to a financial basis as commerce adopted a monetary system. The many at risk from a similar peril contributed a small amount each to a central pool, which compensated the few who suffered the loss. Insurance spread from ships and cargoes, to buildings, plant and other assets, on to liabilities and personal injury and into specialist areas like loss of profits, pluviosus (rainfall), crops, holes in one and so on. Insurance embraced new areas of technological progress and today the insurance of motor vehicles, aircraft, space craft and computers are all commonplace.

The simple concept of the many contributing to the losses of the few developed into a separate branch of the law and principles of indemnity, insurable interest, proximate cause, subrogation and utmost good faith became the

foundation of the practice of insurance.

The type of occurrence conferring the right of a pay-out became known as the 'peril insured against' and these also expanded over the years. The marine perils of fire, thieves, jettison or loss at sea, barratry and restraint of kings princes and people (Turner 1971) have grown with the classes of business to encompass burglary, forgery and defalcation, collision, professional negligence, inability to work through injury or illness, explosion on the launching pad and others too numerous to list. In fact, some policies gave up listing them and opted for the notorious and misleading term, 'all risks'.

As an aside, I know of no insurance policy which has used the term, 'act of God' either as a peril or as an exception to coverage. It is a popular misconception that insurance policies either do, or don't, cover 'acts of God', and the same people seem to be able to hold both beliefs simultaneously. The insurance industry has never been noted for its religious leanings and acts of God are nowhere defined or universally believed in.

In its enthusiasm to expand the list of perils for which insurance was available, the industry swept into the fields of flood, storm and hurricane, earthquake, volcanic eruption, man made disasters and other catastrophic events. And there, in the opinion of this author, it met its limitations.

### The theory of insurance

Insurance utilises the natural probability law of large numbers: The larger the number of exposures to risk of independent, homogeneous units the closer will be the actual number of casualties to the probable number in an infinite series (Cockerell, 1987).

So it is necessary for a large number of persons or organisations to be independently at risk from the peril to be insured against. That peril will have a financial impact on the individual but its occurrence must be sufficiently unlikely as to warrant a relatively much smaller outlay of premium. The visitation of the peril must be a random event and all subjects insured must be equally likely to incur it (or as nearly equal for any

differences to be coped with by minor adjustments in individual premiums). Fire and motor vehicle insurance both fit the bill well (Walker, 1995).

Under these conditions, as a result of the law of large numbers, annual losses to the insurer (the holder of the premium pool) will tend to be predictable, enabling the fund to be operated with a high degree of assurance that all calls upon it can be met. Also, because the number of individual events each year is large, it is possible to undertake detailed analyses and construct a sophisticated pricing regime. In this way, the sharing of risk can be made more equitable and, by charging higher premiums for greater degrees of risk, can be used as an incentive to mitigate (Walker, 1995).

The insurance mechanism runs into danger when the peril insured against is not one to which all individuals or organisations are independently vulnerable, but are all vulnerable at once. This is the situation which occurs with the occurrence of natural or man-made disasters like earthquakes or pollution. Instead of the normal randomly selected, but predictable number of, victims, whole swathes of an insurer's portfolio become claimants all at the same time, threatening the financial stability of the firm and its operational ability to cope.

### **How insurance copes with disaster events**

There are two ways adopted by the insurance industry to cope with this problem.

Firstly, companies apply various severe limitations to the coverage they are prepared to sell. The most vulnerable properties are not offered coverage at all. Property owners who can buy insurance are forced to keep much of the risk, through high excess levels (the amount deducted from any claim) or ceilings on the amount to which they can insure. In California, the standard residential earthquake excess is US\$15,000, although this can be lowered by paying an extra premium. In Turkey, the amount deducted from a claim is normally 5% of the value of the property, taken from the 80% of the cost of damage which the insurance company carries. In Japan, property owners' claims are limited to far less than the value of the damage.

The terms of coverage may be very restricted. In Australia there are several categories of flood defined (rather artificially) in insurance policies. Only some types are covered by insurance.

Premiums for disaster insurance cover

in prone areas of the world are prohibitive. They form a major outlay for homeowners. In the Los Angeles area of California, the premium for earthquake damage insurance is typically over \$1,000 per year for a home - and that is before paying extra to lower the excess.

Second, insurance companies purchase their own insurance against a catastrophic hit on their portfolio. Such catastrophe reinsurance spreads the risk more widely and aggregates it with others in an attempt to get the law of large numbers back in operating order. It is generally provided by separate funds reserved for the purpose.

### **The reinsurance market**

One of the best known centres for reinsurance is Lloyds of London, home of over two hundred separate reinsurance funds or syndicates, all guaranteed by the same central fund maintained by a levy on all members. Lloyds has never been unable to meet its liabilities.

The doyens of the reinsurance industry are in Europe with companies like Munich Re, Swiss Re and General Cologne Re around a century old. By contrast, the market in Bermuda is a new phenomenon, with monoliths Ace and XL Mid Ocean the result of recent furious merger and acquisition activity. Some ordinary insurance companies do more than just dabble in reinsurance, and Axa and St Paul, for example, are major reinsurance players. Lastly, having a reinsurance company is sometimes seen, like having an airline, as a sign of national identity and there are several state owned reinsurers. These are a means of exercising some control over the local industry, and the funds that it causes to flow across borders. It will be realised that, in order to work at all, reinsurance must be an international enterprise.

Although reinsurance spreads risk, there are limits to the spread that can be obtained and big events like Hurricane Andrew in 1992 can threaten the stability of the industry. Reinsurers seek healthy rewards for taking on such commitments. The additional layer of activity adds to the cost of insurance. Catastrophe insurance requires higher premiums than normal insurance for the same risk level, and the greater the potential aggregation effect the higher the premiums required (Walker, 1995).

Competition and reality do battle in the reinsurance industry as elsewhere and pricing swings result. The customer of the catastrophe reinsurer exchanges the long wave volatility which could bring

about the ruin of the enterprise, for the shorter wave mercurialism of a highly competitive, short-sighted industry. Reinsurance prices have traditionally been most influenced by the proximity and size of the last big disaster.

EQC has placed one of the world's largest catastrophe reinsurance programs in the market for over ten years now, and its annual pricing experience serves as an example.

This is not the only matter that has had to be contended with. The availability of capacity has also been problematic in the past, although there is an argument that the industry has resolved this issue, partly by introducing large amounts of new capital and partly by straying into financial markets with newly designed hybrid products for the protection of insurance portfolios.

EQC first entered the market with a programme designed to soak up all the capacity of acceptable security (perceived ability to keep its side of the bargain when the earthquake occurred). This was estimated at around NZ\$1 billion worldwide. Five and six years later (Hurricane Andrew having blown away more than some towns and villages in Florida), such a programme could not be filled and EQC had to be content with three quarters of that amount. For the past two years, at least, as the seller's market attracted capital, EQC has placed a programme of over NZ\$1.5 billion and could have placed twice that, at the price taken (that is a guess, of course, as we did not test the market).

### **The human element**

So insurance companies offer a partial, expensive financial disaster protection to the property owner. Many people take the rational decision not to insure because the product is so poor and the likelihood of needing it so low. Today, even after the Northridge earthquake in Los Angeles shocked some out of their complacency and gave the impetus to the formation of the California Earthquake Authority, the figure for California is reported as 17% of homes insured against earthquake. The World Bank cites 15% as the proportion of homes insured in Istanbul, with the figure elsewhere in Turkey as low as 2%. At the time of the 1995 earthquake at Kobe, Japan, only 3% of the homes in the prefecture had insurance.

Another paradigm is at work here; it is the natural human tendency to shut out unpleasant possibilities, or do anything about them. There is a well-documented

hierarchy of denial:

- it is not going to happen
- if it does happen, it will not effect me
- if it happens to me it won't be too bad
- if it happens to me and it's bad, there is nothing I can do, so why are you badgering me with exhortations to protect myself?

Just designing a limited insurance product and putting it on the shelf to sell does not address the need of the community. Like any 'bad', the product must be pushed out to the market and sold by persuasion, even coercion. The fact that few home-owners are contributing to the premium pool (and these are probably those for whom the risk is most apparent, so that insurers are being selected against) increases the insurance companies' risk levels and they react by raising prices and limiting coverage even more, thus further discouraging buyers and perpetrating a continuous spiral.

## Solving the problem

### The EQC scheme

New Zealand's post war politicians may have had an inkling of this theoretical framework or they may have stumbled upon a good solution which geological luck has turned into a winner. Over the past fifty-five years this country's state-sponsored disaster insurance scheme has been tinkered with—most notably in 1993 when it was withdrawn from the non-residential market—but its vital features have remained. The scheme adopts an insurance framework but counters its failings by using the power of the state.

The features of the Earthquake Commission (EQC) insurance scheme are:

- Universality—the scheme is as compulsory for residential property owners as the premium collection mechanism can make it. If a home is insured, then the insurance company is compelled to pay the EQC premium and EQC is bound to insure. Thus EQC insures about 90% of New Zealand homes and the human denial hierarchy is irrelevant. Until 1993, commercial property owners were also compelled to insure with EQC. Continuation of this would have necessitated a far more complex form of cover and increased EQC's liabilities to unmanageable levels. It appears that the insurance industry is needed here in all its choice and variety; commercial property owners can make their own risk management choices, including alternatives like facility duplication and avoidance of risk-prone areas. The absence of a duty to

businesses to ensure their survival allowed the Government to withdraw from this insurance coverage.

- Near universal application of the scheme allows reasonable terms and conditions to be applied. The EQC premium rate of 5 cents per \$100 of cover is the cheapest in any geologically hazardous area in the world. Excess levels are nominal; EQC pays 99% of the claim amount subject to a minimum contribution of NZ\$ 200 by the claimant (the land coverage provisions are different).
- Coverage is for physical damage. Although there is a maximum sum insured (\$NZ 100,000 on each dwelling and \$NZ 20,000 on contents), over 95% of all damage to homes will be met by EQC because virtually all damage up to the sum insured is covered.
- The perils insured against are earthquake, volcanic eruption, hydrothermal activity, landslip and tsunami. Fire following any of these is covered.
- The insurance is simple. It covers the stated perils, for a specified sum, under quite straightforward terms and conditions. In particular, there is one flat rate of premium. This avoids the endless controversy that differential rating, to try to reflect various shades of risk, would generate.
- Premium collection is a simple matter—another legacy of a flat rate system. The edict is unequivocal—if you insure your home your insurer must pay the EQC premium (which is then collectible from you) and EQC must provide the insurance. Apart from a few fringe issues surrounding the definition of a 'home' and suchlike (e.g. is a caravan on a permanent site, a student hostel, a private hotel, a 'home?') the scheme virtually runs itself, with minimal record keeping at EQC.
- Despite all this simplicity, the scheme has some innovations not found in other insurance policies, demonstrating its priority of meeting the needs of citizens over the practices of the insurance industry. The scheme covers loss of land from the perils listed above plus storm and flood. EQC will reimburse the value of the land around and under the house and that under the main access way to the property. There is a higher excess regime applicable to this cover. The Earthquake Commission Act defines physical damage to include damage which has not yet occurred but which is imminent, a provision which exercises the Commission's claims staff and advisers

extensively from time to time.

- Apart from premium collection which can be readily policed, EQC is independent of the insurance market and any other commercial enterprise. EQC is not a creature of the market, neither does it rely on it for funding, claims settlements or continued existence.
- EQC concentrates the need of a small country for reinsurance protection, and thus becomes a powerful buyer. The size of its programme and its ability to provide quality analysis (because it can utilise national statistics) make it a prestigious client in the world-wide reinsurance market.
- The legislation controlling EQC contains a government guarantee that all the obligations of EQC will be met. This is a necessity for a compulsory scheme and it provides EQC with the best financial security available. Standard and Poors recognise this with their claims paying ability rating of AAA for the Commission.
- EQC is not set in a competitive environment. Setting aside financial reserves and preparing to help a community to recover from a disaster do not fit an environment driven by market forces. Non commercial performance measures and controls can ensure an ability to be prepared for the event, treat claimants fairly and expeditiously, invest funds wisely, encourage mitigation and research, and play the right part in the coordinated approach that is essential to a disaster recovery operation.

EQC can be seen as a creature of its time and culture. It has worked through good luck; Ruamoko, the Maori god of earthquakes and volcanoes, has not rolled over violently in all the years EQC has existed. Other countries have their own means of compensating for the shortcomings of the insurance market. Spain, California and other states of the USA, Iceland and numerous national pooling arrangements all provide examples of centralised systems. As international agencies like the World Bank encourage disaster-hit countries to seek ways of mitigating the affects of the next catastrophe, there are many models to investigate.

### Catastrophe response

A part of the insurance compact often overlooked is the need, as well as taking the premium and issuing the policy, to be able to deal with claims. In normal circumstances, this is rarely an issue, but a disaster event imposes huge financial

and logistical burdens on an insurance company.

Planning for the event and putting in place the logistical preparations do not come easily to commercially driven organisations. They require investments of time and money which may not provide a return during the working lives of those responsible for them. The experience in other countries is that, with the exception of extremely large companies like State Farm in the United States, insurance company—or industry—plans, such as they are, are found wanting when disaster strikes. In not only the insurance industry, disaster planning is too easily relegated to an area which never receives attention. An organisation like EQC is focussed on being ready for the widespread catastrophe and has the ability to make realistic, cost-effective arrangements which are, however, a pure drain on the bottom line. This need is well recognised by the government and the national treasury. The shareholders of commercial entities tend to be not so insightful or patient.

### EQC's preparations

Concentrating the financial protection of homes into one organisation means concentrating the means by which that protection will be activated. An organisation like EQC is focussed on high impact but very low probability events. A small staff is all that is necessary to run the scheme day to day—ensure premiums are collected, the normal trickle of claims are met and the ordinary chores associated with running an efficient office are done.

This core of personnel requires manifold but scaled expansion when a catastrophe occurs. Even a non-profit organisation could not maintain the hundreds of staff that would be necessary to cope with the worst case scenario. It is a financial and logistical impossibility. The solution adopted by EQC has been to become a 'virtual organisation'.

Virtual organisations employ a minimum number of permanent employees but achieve their objectives through a web of contractual out-sourcing arrangements. At EQC we have researched our needs following a disaster of the type to which we will be called upon to respond. We have then sought out the best suppliers via tenders or market intelligence and signed contracts for the supply of specified products or services up to agreed levels within a certain period after being notified. For this, EQC pays annual retainers and agrees the costs it will meet

if contracts are activated.

As already stated, being ready incurs a financial expense for a benefit that may not accrue in a working lifetime. As well as the cost of the retainers, the costs of the exercises, tests, training and maintenance of interest of all our catastrophe response partners, are considerable. Altogether, EQC expends several millions a year on just trying to be ready. This has to be seen as legitimate operational expense.

Once contractual arrangements are in place, EQC incorporates them into its day to day operations. It is the best form of testing and exercising. So EQC is permanently in catastrophe response mode; most of the time we are ticking over on idle, but responding to an unusual sudden event is a matter of scaling up to the necessary levels what is already there, not trying to activate an arrangement that has, at best, only been tested or exercised in rather artificial circumstances.

Perhaps some examples will make things clearer.

On a day by day basis, EQC could control its 3,000 or so claims a year on a notebook computer with off-the-shelf software applications. However, our computerised claims management system resides on mirrored IBM AS400 mini-computers linked to NT servers (if this incomprehensible to you, what I am saying is that these are powerful machines with fail-safe features). With the software these computers run, EQC has the capability of managing up to 200,000 claims from a single event—our worst case. The critical point is, we run our claims from this system all the time. We have out-sourced the running of the system to IBM and our day to day usage has ensured mutual understanding of needs and confidence that the system works.

We have also out-sourced to a third party claims administration firm in Australia, the 'back office' claims handling function. Our two claims staff at EQC head office in Wellington could easily cope with a normal claims level, but it would take forty such people to service a 60,000 claim event. Our partner could expand to meet this demand within the time frame we have agreed, and in the meantime they handle all our claims. They are not waiting for the day when EQC has to activate the contract, they are operating under it now.

A vital part of a catastrophe response is to keep the public informed. Our communications and public relations consultants have been involved in our planning right from the start. With them,

we have designed information resources as ready as possible for release. These are press releases, advertisements, radio announcements, posters for distribution in the affected areas (for example, by nailing them onto lamp posts and telegraph poles or placing them in shopping malls and libraries), mail drops and notes for the Chairman or a Commissioner who may be called by the press. Our consultants should glide from their normal service level into the task of catastrophe response.

Not all activities necessary for a large catastrophe response can be built into day to day routines or envisaged as a simple scaling process. For example, if Wellington were affected by the earthquake, it may be necessary to operate the EQC hub from somewhere else. We have prepared for this to the extent that we have an alternative site, partially serviced and configured, at Manakau near Auckland and we can operate our alternative computer systems from there. Another retainer we have is with a helicopter operator from out-of-town. The aircraft will circle certain agreed landing sites in Wellington to pick up EQC staff if they are available and transfer them, firstly to a central location, and then out of the disaster area in order for them to make their way to Manakau. Obviously, this is not something we can incorporate into normal office procedures (however much the staff enjoy scenic helicopter flights) or do by sample or on a small scale, so we rely on testing the arrangement on paper and having an exercise at least once each year. So the staff get their ride.

In order to manage and control this web of contractual obligations and to scale up (and down, as the work load starts to decline after the event) effectively, sophisticated information and supervisory systems are required at headquarters. EQC has invested in some advanced technology. A hazard expert system, due for delivery early in 2001, should give vital initial indications of the expected affects of a large earthquake. EQC's initial response will be informed by the number of claims by categories of severity, their distribution (shown on a geographical information system) and total cost, as calculated by this computer program. Input of the total number of claims expected into a specially designed systems dynamics model will provide indications of the extent and areas of scaling up required. The balance among the various resources called upon by EQC will be monitored on this model to gain insights about bottlenecks and surpluses.

A future development is to have the model provide cash flow projections for both the costs of running the response and of actually settling the claims.

There are plans to utilise the internet to make available EQC's repair costing software. This should help to standardise and expedite the settlement of claims. The involvement of the building industry in compiling the database of material and labour prices is intrinsic to the success of this endeavour.

## **EQC's other roles**

### **Facilitating research**

EQC's disaster insurance scheme benefits from the other roles the government assigns the Commission under its Act. These are also functions that entities driven by commercial imperatives find difficult to undertake, and government control ensures they are not just left to chance. The Commission's expenditure on research and mitigation advice not only serves the objective of safer communities but reduces the potential for claims and their cost when they do occur.

Support for research into natural disasters and methods of reducing or preventing the damage they cause is primarily given through the Earthquake Commission Research Foundation. This internal EQC body has the objective of:

Reducing the damage caused by natural disasters as defined in the Earthquake Commission Act (1993) in order to build safer communities by:

- providing support for activities and research projects
- generating, disseminating and applying knowledge
- developing skills

The Foundation conducts biennial contestable grants rounds of about NZ\$700,000. Applications are open to all New Zealanders and are judged by a panel of independent experts. The average value of the 105 projects approved under this programme in the past ten years is just under NZ\$ 30,000. Project times of up to three years are allowable. About one in four applications is successful.

Projects are peer reviewed. On completion, summaries are placed on EQC's web page and published in the New Zealand Society for Earthquake Engineering's Bulletin. Copies are sent to university and national libraries. They are available from EQC free or at cost of reproduction.

Other assistance for research includes expenditure of NZ\$ 150,000 per year on university scholarships and lectureships in order to develop research skills and

encourage entry into the fields related to seismic studies. Organisations that utilise and promulgate the results of research are supported to the extent of NZ\$60,000 per year and New Zealanders who participate in conferences and workshops at home and overseas, or who travel to the sites of recent earthquakes to report on aftermaths, are funded.

Thus, through EQC, the government is investing in the growth of expertise and knowledge, and the country's level of preparation for disaster.

A future role for the Foundation is to attract other funding from outside the Commission. The Foundation has been set up as a pseudo-trust so that conversion to a true trust to meet the needs of other participants would be an easy task. EQC looks forward to a time when the Research Foundation is recognised as a means by which some private enterprise firms may invest in research and development.

The Commission itself is investigating with Government the possibility of extending its role in research to partnering with the Institute of Geological and Nuclear Sciences to provide the national hazard monitoring network needed by a country which sits astride two of the world's major tectonic plates. 'Free to air' availability of the output of a world-class monitoring system would revolutionise the research capability of New Zealand scientists.

### **Public education**

People have to know how to help themselves, and EQC has a role in public education. The Commission produces two school kits for the national curriculum. It also supports the Institute of Geological and Nuclear Sciences/Victoria University initiative called 'Quake-trackers', by which seismographs with ancillary equipment are installed in selected schools and the pupils taught how earthquakes are detected and characterised. Their work adds to the earthquake catalogue and is real research.

The Commission's television advertisements, magazine articles, newsletters, seminars, brochures and 'how to' sheets all make a contribution to increasing public awareness and knowledge. Collaboration with other organisations like local authorities, the Ministry for Emergency Management and the Insurance Council have resulted in posters, press announcements, Guidelines for Local Authorities and Telecom Yellow Pages revisions. Maintaining levels of awareness and knowledge is an onerous task and a

collective approach among several agencies is the way of the future.

EQC's flagship for public education is its sponsorship of the Awesome Forces exhibit at Te Papa (the Museum of New Zealand). This very successful investment has improved public knowledge through an enjoyable experience of the country's spectacular geological and meteorological features. It is not the only sponsorship of its kind; EQC also provides funds to the Taupo Volcanic Activity Centre and to travelling exhibitions which attract school children. EQC has its own static displays which tour the country, appearing in libraries, banks, shopping malls, conferences and other public places.

The Te Papa exhibit spawned a series of lectures and a book, both also sponsored by EQC which has provided funds for several publications, most recently 'Caught in the Crunch' by John Taber and Rebecca Ansell (Harper Collins), 'Rocked and Ruptured: Geological Faults in New Zealand' by Jeffrey J. Aitken (Reed) and 'Magnitude Eight Plus: New Zealand's Biggest Earthquake' by Rodney Grapes (Victoria University Press).

Educating the public by popularising science and reaching out to school-children is seen by EQC as the future trends. A recent trial of supplying to parents through primary school children samples of household safety hardware with instructions on use had a promising result.

Showing and telling the public how they can preserve their homes and possessions from damage is another matter which can be progressed and maintained only through collaboration, coordination and cooperation among many organisations. These approaches are all of a type that are at odds with competition and market dictates. Their import is good reason for government involvement in many aspects of New Zealand life. Public education, with its spin-off of better claims outcomes, is therefore a neat fit with government-sponsored disaster insurance.

### **Conclusion**

We cannot predict disasters to a degree of accuracy that is of much practical use. It is not the disasters themselves that create the problem; it is the human settlements, with their accommodation, commerce and infrastructure, that cannot withstand the forces sent against them. We can still do much to make these communities safer and better prepared.

There is a need in a country particularly prone to one type of disaster or another, for an organisation with a duty and an

interest in sending out the mitigation message. People can make their homes and businesses safer by taking quite elementary precautions. For an organisation like EQC, a government agency tasked with bearing the financial brunt of damage to homes following a catastrophic event, there is self interest and promotion of the public good involved in encouraging mitigation activity.

This is the third leg of the EQC stool; the legs which make for the stable and focused organisation are:

- a simple, universal scheme for the affordable insurance of New Zealanders' homes
- a comprehensive plan for responding to a natural disaster
- a programme of public information, supported by strong support for research and science, on how communities can make themselves less vulnerable to the effects of extraordinary natural events.

EQC cannot prosecute any of these activities alone. The insurance scheme requires the collection of premiums and this is currently done through the insurance industry. Planning for the big event must be progressed in conjunction with all the other organisations that will have parts to play in the response and

restoration. There will be a chain of assistance and that chain, as the saying goes, will be only as strong as its weakest link. This is our challenge to all our potential colleagues. A real challenge for community leaders will be to coordinate all this effort.

Community preparedness is another shared responsibility. The susceptibilities of emergency services, infrastructure, lifelines, vital facilities, means of transport and communication, supply chains, commerce, and organisational structures are each critical to the performance of the whole.

Preparedness will never be complete. EQC continues to reassess and improve its own catastrophe response program. I will end with one of the tenets to which we hold: we are better prepared this week than we were last week, and next week I will say the same.

#### References

Turner H.A. 1971, *The Principles of Marine Insurance*, 6<sup>th</sup> edition, Stone and Cox.

Cockerell H. 1987, *Wetherby's Dictionary of Insurance*, 2<sup>nd</sup> edition, Wetherby and Co. Ltd.

Walker Dr. G. R. 1995, 'Prediction of Insurance Loss from Earthquakes', *Pro-*

*ceedings of Pacific Conference on Earthquake Engineering, 20-22 November 1995*, Melbourne, Australian Earthquake Engineering Society, Vol. 2, pp. 353-361.

#### About the Author

David Middleton, FCII, MBA, was appointed General Manager of the Earthquake Commission (EQC) in January 1993. His first task was to lead the organisation through the withdrawal of compulsory property and the conversion of the scheme to a purely residential one based on modern insurance practices. During David's time at EQC, the Commission has developed its capability to respond to a large influx of claims following a serious event and formalised these logistical plans into its Catastrophe Response Program. The Commission has also continued to lead the way in New Zealand in the area of natural disaster research funding and education about mitigating damage.

A Chartered Insurer, having been elected a Fellow of the Chartered Insurance Institute, David is also a Fellow of the New Zealand and Australian Institutes, and has also completed a Master of Business Administration degree with distinction, at Victoria University.

**This article has been refereed**

## New Disaster Web Site

### Disasters on the Web: providing an index to information for Victoria, Australia – [www.disasters.au.com](http://www.disasters.au.com)

#### New disaster Web site

A new Web site launched in March 2001 at GDIN2001 in Canberra has been developed under a grant from EMA to explore how disaster-related information on government and other Web sites can be located and made available to the community.

This Web site is designed to help 'improve community awareness of risk, preparedness and response' (Australian Goal 1) and also provides useful information for schools (IDNDR Major Theme 2. Education 2000) in the primary, secondary and tertiary curricula, by making use of the Internet, and developing and evaluating the effectiveness of a Web-based current disaster information service.

The site provides a starting point for seeking disaster information for Victoria, with a guarantee of up-to-date and accurate information, and links to information on individual disasters, indexed by type. Geological, meteorological and human-caused disasters are all included. Links to further information on the region in which a disaster has occurred e.g. satellite imagery, maps, climatic data, links to researchers with a prior knowledge of the area, and to available scientific and other

publications, reports and data sets is also being provided when available.

In addition, the site is developing data sets of background information, including information on the study and understanding of such disasters as earthquakes, landslides, floods, storms and fires. A related new site which is beginning to develop information on the risks and hazards associated with possible future volcanic activity in Southeastern Australia is also being linked to this disaster Web site for Victoria.

The site is currently housed on a University of Melbourne server, and is most easily located via the Web URL: [www.disasters.au.com](http://www.disasters.au.com)

*For further information contact:*

Bernard Joyce  
Senior Research Fellow, School of Earth Sciences  
The University of Melbourne, Victoria, 3010, Australia  
Email: [ebj@unimelb.edu.au](mailto:ebj@unimelb.edu.au)

*The project has been supported under IDNDR Project 12/99 'Disaster Information on the Web: index to current and reliable information' 1999-2000.*



# Retirement from the field – Hori Howard



Major General Brian (Hori) Howard's retirement from the position of Director General NSWSES ends a long and significant involvement with the emergency management industry generally and the State Emergency Service particularly. Whilst many will join me in expressing sadness at Hori's retirement, nevertheless I must say that my liver is rejoicing at the prospect. Hori's prowess at the bar is legendary, but more of that later.

Hori's career in emergency management took place over two phases. He was already established as the Director General of the Natural Disaster Organisation (NDO) when I first met him, and there is no doubting his significant contribution towards the culture of that organisation, particularly the role of ACDC and EMA's relationship with the States. He was untiring in promoting the value of the work of the College whilst at the same time demanding that it should be rigorous in improving its operations to maintain its' high standing. In doing so he confirmed and actively supported the College's move from training towards a broader range of multi-sectional disaster/emergency management activities.

From the outset Hori took a firm line with ACDC, demanding its contribution to the development of a more efficient and effective national emergency management capacity. Only when it proved it could do so to his satisfaction did he become the College's strongest supporter, which earned him the respect which has continued to this day (coupled with a fair amount of awe) by those who worked with him in those hectic, but productive, years.

In recognising the need for more extensive local delivery of basic emergency management courses than then being delivered by ACDC, he insisted that the College develop and distribute training packages, such as the Introduction to Emergency Management, for delivery by the State emergency management organisations and required students to have completed these as the precursor to attending any of the College's other activities.

Furthermore, he was the major contributor to a landmark 1989 publication 'Commonwealth Counter Disaster Concepts and Principles' which established the modern doctrine of 'comprehensive and integrated emergency management'. The booklet is still a primary reference work.

This background is all the more notable because, as one of nature's 'action men', Hori is not naturally predisposed to look kindly upon trainers. One can only wonder what he must have thought of those who claimed to *train* the trainers! Imagine when he became DGND0 to discover that amongst his staff at ACDC he had inherited people of both persuasions.

Following his impending retirement from the military and as DGND0, Hori was head-hunted by the NSW Government to head up the NSWSES which was, at the time, experiencing some difficulties. The changes he has implemented in NSW are remarkable and extensive. He turned the SES from a general purpose emergency service to an organisation capable of carrying out the specific role of a combat agency. He reformed the state headquarters of the NSWSES and sharpened its focus on providing leadership to volunteers and support to flood and storm effected communities. He modernised the NSW SES's equipment, communications systems and vehicles and was responsible for initiating comprehensive equipment replacement programs. By improving the SES's profile he helped it to gain respect and credibility in the community and increased the pride felt in the organisation felt by both its volunteers and staff.

He drove the adoption of competency based training for SES's on a national basis and was a key player in the adoption of the national training reform agenda. His suggestion of the SES National Training and Education Committee has led to a body representing each of the states and territories that, to this day, is responsible for achieving national training standards which are the envy of many other emergency service organisations.

His sharp mind certainly doesn't suffer fools gladly, but once you have convinced Hori of the benefit of a particular course of action he will commit to it enthusiastically and wholeheartedly. Hori advocated the concept of a peak body to represent the SES's and was instrumental in the establishment of the Australian Council of State Emergency Services (ACSES) and its second Chairperson. In this role he contributed to a major change to the professionalism of SES staff and volunteers nationally. The respect with which Hori is held by his volunteers was evident to

anybody visiting NSWSES or meeting their volunteers in other venues. Hori was a man for the people and was always working with the volunteers, coaxing, cajoling, praising and supporting them.

It wouldn't be appropriate to talk about Hori without a drinking story, so here it is. I had been appointed as Director of VICSES for about two months when he rang me in his role as DGND0.

'We're off to lecture at the Industrial Mobilisation Course (IMC).'

I, of course, knew nothing of the Industrial Mobilisation Course.

'I will pick you up at 2:30 on Tuesday afternoon', he said. 'I'll have a Commonwealth car, so we will travel together. Bring an overnight bag.'

Discovering we were actually lecturing at 8:30 the next morning, I was told of the need to go down and reconnoitre the place and establish our credentials. I leave it to your imagination what 'reconnoitre the place and establish our credentials' means.

Suffice to say that I left the Officers' Mess that night at 1:30am feeling very 'tired', leaving a boisterous Hori standing on the grand piano holding a carafe of white wine leading community singing. Not surprisingly, the next day Hori was fresher than me at breakfast and since then I have always treated a drinking session with Hori with the respect and awe that it deserves!

His act will indeed be a hard one to follow and I believe everybody in the Australian emergency management industry and overseas will wish him well in his retirement.

Rhys Maggs

Director

Victoria State Emergency Service

with acknowledgements to Roger Jones and Chas Keys

# National memorial

## Entries sought to design National Emergency Services memorial

The Port Arthur massacre, Cyclone Tracey, Newcastle earthquake, Ash Wednesday, Granville rail disaster, Thredbo landslide. These tragedies sent shockwaves across the nation and around the world.

When they were needed most, our emergency services personnel came to the rescue, putting their own lives at risk to save others.

In recognition of the supreme sacrifice made by members of the emergency services across Australia, the Federal Government has committed \$1 million to construct an Emergency Services Memorial in Canberra.

The memorial will be built in a prominent site on the northern banks of Lake Burley Griffin and the National Capital Authority will manage its construction.

Australian architects, sculptors, engineers, landscape architects, artists and designers are being urged to enter the competition which carries a \$15,000 first prize.

Chairman of the National Capital Authority, Air Marshal David Evans, said at a spectacular launch on June 19, that the National Emergency Services Memorial would become a unique place for commemoration of and reflection on the

broad range of emergency services personnel, past, present and future.

'The memorial will acknowledge their role, honour their contributions and, in particular, pay tribute to their sacrifice', Air Marshal Evans said.

Launching the design competition, the Minister for Regional Services, Territories and Local Government, Senator Ian Macdonald, said the new memorial would honour and express thanks to police, ambulance, fire brigade and other emergency services who together, make the community a safer place.

'Over the years countless Australian lives have been saved through the efforts of this network of highly-skilled and dedicated people', Senator Macdonald said.

The project also has the strong backing of Prime Minister, John Howard.

'This memorial will register our gratitude to all emergency service personnel who selflessly place themselves in harm's way in the line of duty', the Prime Minister said.

At the competition launch there was a spectacular display by the full range of emergency services, including the Snowy Scheme SouthCare Rescue Helicopter.

Entries for the competition close on August 16 with work on the memorial

expected to start in the first half of next year.

Steering Committee members who are guiding the development of the memorial are:

- Associate Professor Desley Luscombe, Chair (Head of Architecture, Faculty of the Built Environment, University of New South Wales)
- Mike Castle, Australasian Fire Authorities Council Inc.
- Andy Fryar, Volunteering Australia Inc.
- Peter Lucas-Smith, Australian Council of State Emergency Services
- Jon Quiggan, Convention of Ambulance Authorities
- Commander Paul Hornbuckle, Conference of Commissioners of Police of Australia and the South West Pacific Region
- David Templeman, Emergency Management Australia.

Full details of the design competition are available on the National Capital Authority website:  
[www.nationalcapital.gov.au](http://www.nationalcapital.gov.au)

(Editors note: Photographs of the launch are also available from the National Capital Authority website)

## Disaster Events Calendar

### **MSc Course in Earthquake Engineering Risk Management**

Offered by: Engineering Seismology and Earthquake Engineering Section; Department of Civil and Environmental Engineering; Imperial College of Science, Technology, and Medicine; London.  
More information is available at:  
[www.esee.cv.ic.ac.uk/eerm.htm](http://www.esee.cv.ic.ac.uk/eerm.htm)

Contact: Professor A.S. Elnashai  
ESEE Section

Department of Civil and Environmental Engineering  
Imperial College of Science Technology, and Medicine  
Imperial College Road  
South Kensington, London SW7 2AZ, U.K.  
phone: +44 0 20 75946058  
fax: +40 0 20 72252716  
email: [a.elnashai@ic.ac.uk](mailto:a.elnashai@ic.ac.uk)

November 3-7, 2001  
Riverside, California

### **International Association of Emergency Managers (IAEM) Annual Conference and Exhibition**

Contact: IAEM  
111 Park Place, Falls Church, VA 22046-4513  
phone: 703 538 1795  
fax: 703 241 5603  
email: [iaem@aol.com](mailto:iaem@aol.com)  
[www.iaem.com](http://www.iaem.com)

November 5-7, 2001  
Los Angeles, California

**Developing, Writing, Implementing, Testing, Managing, Maintaining Your Recovery Plan**  
Offered by: DisasterRecovery.com Inc.  
Contact: DisasterRecovery.com Inc.

812 Proctor Avenue  
Ogdensburg, NY 13669  
phone: 1 800 361 8398; fax: 520 441 4170  
email: [phoenix@binomial.com](mailto:phoenix@binomial.com)

November 5-23, 2001  
Bangkok, Thailand

### **Twenty-Eighth International Disaster Management Course (DMC-28)**

Offered by: Asian Disaster Preparedness Center (ADPC)  
Contact: Training and Education Division  
Asian Disaster Preparedness Center  
PO Box 4, Klong Luang, Pathumthani 12120, Thailand  
phone: 66 2 524 5386/524 5362  
fax: 66 2 524 5350/524 5360  
email: [tedadpc@ait.ac.th](mailto:tedadpc@ait.ac.th)  
[www.adpc.ait.ac.th](http://www.adpc.ait.ac.th)

# Disaster Events Calendar

**November 19-23**  
**Melbourne, Australia**

**Aurisa2001: Creating the Links**

The Spatial Information Association: Australasian Urban & Regional Information Systems Assoc. Inc  
Contact Australian Convention and Travel Services Pty (ACTS) Acting as Agent for AURIS 2001-04-04  
GPO Box 2200  
Canberra ACT 2600, Australia  
phone: 61 0 2 6257 3299  
fax: 61 0 2 6257 3256  
email: aurisa@ausconservices.com.au

**November 23-25, 2001**  
**Kobe, Japan**

**Second Asian Symposium on Risk Assessment and Management**

Host: Society for Risk Analysis-Japan  
One special conference topic is 'Natural Disaster and Risk Management'  
Contact: Saburo Ikeda  
Secretary General, SRA-Japan  
c/o Institute of Policy and Planning Sciences  
University of Tsukuba  
phone: +81 298 53 5380  
fax: +81 298 55 3849  
email: srajan@ecopolis.sk.tsukuba.ac.jp  
http://ecopolis.sk.tsukuba.ac.jp/~srajan

**November, 26-28, 2001**  
**Washington, D.C**

**Developing, writing, implementing, testing, managing, maintaining your recovery plan**

Offered by: DisasterRecovery.com Inc.  
812 Proctor Avenue, Ogdensburg, NY 13669  
phone: 1 800 361 8398  
fax: 520 441 4170  
email: phoenix@binomial.com

**November 29-December 2, 2001**  
**San Diego, California**

**Critical Incident Stress Management Suite of Workshops**

Offered by: International Critical Incident Stress Foundation (ICISF)  
Contact: ICISF  
10176 Baltimore National Pike  
Unit 201, Ellicott City, MD 21042  
phone: 410 750 9600  
fax: 410 750 9601  
www.icisf.org

**December 4-6, 2001**  
**Basel, Switzerland**

**International Conference on Tunnel Management Systems, (conference and trade display)**

The conference is intended to bring together designers and users of tunnel management systems and associated equipment. It will be of special interest to Owners and Operators of tunnels, Consulting Engineers, Control Centre Specialists, Communications, Control Instrumentation Engineers, Risk Managers, Insurers, Legislators & Regulators, Responding Organisations and Fire Service Personnel.

Contact: Stephanie Whitham, ITC Ltd  
phone: +44 1234 854756

fax: +44 1234 841375  
www.itc-conferences.com

**December 16-18, 2001**  
**Indore, M.P., India**

**International Congress on Environmental Emergencies and Pollution**

Sponsor: Research Journal of Chemistry and Environment  
Contact: Dr. S.L. Gargh  
Sector A/80, Scheme 54  
A.B.Road, Vijaynagar, Indore 452 010, India  
phone: 91 0731 552837  
fax: 91 0731 552966  
email: chemjyot@bom4.vsnl.net.in  
www.chemenvirom.com

**January 31-February 3, 2002**  
**Orlando, Florida**

**Disaster 2002**

Sponsor: Florida Emergency Medicine Foundation, in collaboration with the Florida College of Emergency Physicians.  
The organizers of this annual international disaster management conference are currently seeking presentation proposals. Details and a proposal form are available from www.fcep.org and www.fcep.org/callforpreframe.htm  
Contact: John Todaro, Director of Education  
Florida Emergency Medicine Foundation  
Florida College of Emergency Physicians  
3717 South Conway Road  
Orlando, FL 32812-7607  
phone: 800 766 6335 or 407 281 7396  
fax: 407 281 4407  
email: jtodaro@fcep.org

**February 24-27, 2002**  
**San Diego, California**

**Solutions to Coastal Disasters 2002**

Organisers: Coasts, Oceans, Ports, and Rivers Institute of the American Society of Civil Engineers; Coastal Zone Foundation; and others.  
The four main conference tracks are Coastal Storms, Seismic Effects, Impacts on Climate Change, and Shoreline Change. A call for papers has been issued.  
Contact: Lesley Ewing  
California Coastal Commission  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105  
phone: 415 904 5291  
fax: 415 904 5400  
email: lewing@coastal.ca.gov  
or Contact: Louise Wallendorf  
Hydromechanics Laboratory  
U.S. Naval Academy  
590 Holloway Road  
Annapolis, MD 21402-5042  
phone: 410 293 5108  
fax: 410 293 5848  
email: lou@usna.edu  
www.asce.org/conferences/cd2002/index.html

**May 20-23, 2002**

**Isle of Wight, U.K**

**International Conference on Slope Instability—Planning and Management**

Contact: Conference Office  
Instability—Planning and Management 2002  
Centre for the Coastal Environment  
Dudley Road, Ventnor  
Isle of Wight PO38 1EJ, U.K  
phone: +44 0 1983 856896  
fax: +44 0 1983 855859  
email: conference@iwight.gov.uk  
www.coastalwight.gov.uk

**May 28-30, 2002**  
**Honolulu, Hawaii**

**Tsecond Tsunami Tsymposium**

Abstracts due September 1, 2001  
Sponsor: The Tsunami Tsoociety  
Contact: The Tsunami Society  
P.O. Box 37970, Honolulu, HI 96817  
or Contact: James Lander  
Conference Chairperson  
phone: 303 497 6446  
email: jfl@ngdc.noaa.gov

**May 30-31, 2002**  
**Miami, Florida**

**Hurricane Andrew 10—Year Anniversary Conference**

Host: International Hurricane Center  
Florida International University  
Contact: Ricardo Alvarez  
Deputy Director, National Hurricane Center  
Florida International University—CEAS 2710  
Miami, FL 33199  
phone: 305 348 1607  
fax: 305 348 1605  
email: alvarez@fiu.edu or hurricane@fiu.edu  
www.ihc.fiu.edu

**June 19-21, 2002**  
**Sintra, Portugal**

**Third International Conference on Computer Simulation in Risk Analysis and Hazard Mitigation**

Organiser: Wessex Institute of Technology  
Contact: Susan Hanley, Conference Secretariat, Risk Analysis 2002  
Wessex Institute of Technology  
Ashurst Lodge, Ashurst,  
Southampton, SO40 7AA, U.K  
phone: 44 0 238 029 3223  
fax: 44 0 238 029 2853  
email: shanley@wessex.ac.uk; kneal@wessex.ac.uk  
www.wessex.ac.uk/conferences/2002/risk02/index.html

**July 7-12, 2002**  
**Brisbane, Australia**

**International Sociological Association (ISA) World Congress of Sociology**

The ISA's International Research Committee on Disasters will host several sessions on disasters.  
Contact: Dr. Maureen Fordham  
First Vice President,  
Geography Department  
Anglia Polytechnic University  
East Road, Cambridge, CB1 1PT  
phone: 01223 363271 ext 2177  
email: m.h.fordham@anglia.ac.uk  
www.ucm.es/info/isa/congress2002/

