

Managing community vulnerability in a wide area disaster

Introduction

In this paper I want to reflect on the gas shortage that occurred in Victoria in 1998 and to consider some of the strategies and programs and methods used to deal with the event and to support the community.

I also want to indicate some of the lessons that were learnt by Government, public administrators and the community from the shortage.

This list of lessons is incomplete. The constraints on the length of this paper has required to select only some of the lessons learnt. But also lessons are still being learnt, new methods and systems applied and tested and new arrangements developed.

Perhaps the biggest issue to have come from the gas shortage is the understanding that public utilities¹ are fragile. And that if they fail through sabotage, accident, wear and tear or overload then the consequences for the community, and for the agencies and services that support the community, can be acute, widespread and protracted.

Perhaps the greatest assets we possess in dealing with these events are the experience, expertise and commitment of politicians, public officials and Non-Government Organisation (NGO) staff. Their professional attributes can only be used successful in a community which values and practises trust, mutual support and socially responsible behaviour. Without this broad culture of personal trust and support allied with professional expertise and political commitment to equity and social support any arrangements to deal with disasters and crisis will find management of the issue significantly more difficult, if it is achievable.

Reflection on the nature of disaster²

Hazards agents as external and independent phenomena

Most disaster management arrangements are developed to deal with events that are, in significant ways, external to the society that is impacted. Floods, wildfires and cyclones for example, although influenced by human modification of the environment, are usually caused and driven by atmospheric or geological processes that are more or less independent of human activity.

by Philip Buckle, Senior Research Fellow,
Risk and Community Safety Research
Initiative, RMIT University

These arrangements, with modification, can often deal with other types of events but require a degree of fine-tuning and an understanding of different types of impacts and consequences.

This issue of the versatility of emergency management arrangements came to the fore in 1998 when an explosion at a gas producing plant in Eastern Victoria effectively halted gas production in Victoria.

For the first time a major event had occurred that was intrinsic to the way in which the society and economy is constructed. For Victoria, despite the earlier 'warnings' around the loss of electricity to central Auckland and the Sydney water crisis, the gas shortage in September 1998 came as an awakening to Government and the emergency management community. It affected most of the geographic area of the State, and it had a direct impact upon 1.8 million households that were without gas, as well many manufacturing and commercial enterprises that lost gas supplies and therefore had to close operations or to restrict their activity.

The first issue, therefore, was the unexpected nature of major and widespread utility failure. The greater part of the Victorian population was effected and Government, disaster management agencies and the entire community were confronted by a situation where the whole jurisdiction was affected. The significance of this, and this is a major learning from this event, is that there was, in effect, no other source of assistance.

The experience of being dependent on limited internal resources or on resources only available from outside to support disaster operations seems to be common in some developing countries. These societies have limited resources to begin with. Significant resource constraint is, however, almost unknown in developed, industrial societies.

Utilities are generally taken to be the community services of gas, water and

electricity, but my remarks are equally applicable in most instances to other public services without which contemporary life would be difficult and or more hazardous. These additional services include public health services, such as sewerage systems and clean and safe food and water, medical and hospital services, medical and pharmaceutical supplies as well as personal and community support services that support the disabled, the ill and disadvantaged and those with needs that cannot be readily met from their own or local sources.

Dealing with vulnerability

Another salient issue with dealing with wide area events is that, by definition, they affect large areas and so in important ways limit access to response, recovery and support services and resources.

Previously, diasters in Australia have affected only part of any given State. On this occasion effectively the whole of Victoria was impacted. Existing emergency management arrangements provide for escalation of support arrangements, resource supply and distribution, in so far as whole municipal areas may be (and have been) affected by diasters. On this occasion the arrangements were not fully appropriate because, under Australian arrangements, the States are responsible for

Notes

1. These can include gas, electricity, water, sewerage, medical, pharmaceutical, telecommunications and food services and supply arrangements. This is not a complete list. Work is underway to progressively identify essential services and infrastructure (and not just physical infrastructure) and the vulnerabilities and coping capacities of individuals, groups and communities.

2. In this paper I use the words 'disaster', 'crisis' and 'emergency' interchangeably. The gas shortage is often referred to by the Politicians and government officers who contributed to its management as a disaster, but also sometimes as a crisis or an emergency. Use of particular terms seems to be a matter of personal preference. There is, in any case, a high degree of overlap between the meanings of these words, even for pedants. And given the state of loosely applied definitions—or even competing or absent definitions—in this area it seems to me that we can assume that there is no harm at this time to taking the words to be synonymous. Clearer definitions would, however, be helpful. So long as they still connect with the real world. When events such as the gas crisis/disaster/emergency occur they strain at our glossary because they are new types of phenomena for which we have to modify or create new descriptions.

emergency response and recovery. Support is available from the Commonwealth under certain conditions and support may be provided by other states. But the final responsibility lies with the States. In this situation Victoria had to deal with the event, loss of gas to the greater portion of its' population, by itself.

This event also drew out in ways that had not been anticipated before, that certain types of people (for example, those on life support systems, those receiving acute medical care at home) are especially vulnerable to particular types of loss, damage or disruption.

Through this event a better, but by no means complete, understanding of the nature of individual, household and community vulnerability was achieved.

In this event vulnerability was heightened by a number of issues. The sheer number of people affected, the lack of an easily obtainable alternative to gas and the importance of gas for certain services (such as particular life support systems).

Background to the gas shortage

For Victoria, despite the earlier 'warnings' around the loss of electricity to central Auckland and the Sydney water crisis, the gas shortage in September 1998 came as an awakening given the area it affected and the proportion of the State it had an impact upon. 1.8 million households were without gas, as well many manufacturing and commercial enterprises lacked gas and needed to close operations or to restrict their activity.

The situation of restricted gas availability occurred after an explosion and fire at Esso's gas refining plant at Longford in Gippsland in the East of Victoria.

The deaths and injuries that occurred were sufficiently serious and tragic in themselves for this to be a major emergency and this how it was, quite correctly, perceived initially

Within 48 hours, however, it had become apparent that there was a another, wider priority that had to be addressed, being the supply of gas to the better part of the Victorian population and the integrity of the gas supply infrastructure if the gas supply was entirely lost.

In the event, the gas supply was cut off, but sufficient gas remained in the system to ensure that the gas distributing pipes were not damaged or compromised, that system integrity was maintained and that certain critical medical needs could, for the time being, be met.

This residual gas was supplemented by 12% of Victoria's needs being made available from New South Wales through

a recently installed connection. This was to be vital in the management process. The then Government established the Central Government Response Centre (CGRC) to coordinate policy and program planning at State level and the Department of Treasury and Finance (DTF) and the Victorian Energy Network Corporation VENCORP worked with Esso to manage the reduced gas supply

Had there been a total loss of gas to the system then the gas-distributing infrastructure may have been damaged as well as the system itself requiring days or weeks for restoration to operational capacity when gas became available again.

The Victorian Emergency Management Council (VEMC) the peak emergency policy advisory body in Victoria met with enhanced membership to consider the emergency management implications and the Department of Human Services established its own coordination arrangements. It was not entirely clear that this was an emergency that could or should be dealt with by the existing arrangements, but the VEMC maintained monitored the situation and played a supporting coordinating and liaison role to the CGRC

Forty-eight hours after the explosion emergency management confronted with 3 separate issues, all of which were related and all of which required immediate attention by government:

- maintaining the integrity of the gas distribution system
- maintaining essential services such as hospitals
- providing support services to the community

Impacts

Immediate impacts

Immediate impacts of the event include the deaths and injuries at Esso's plant at Longford in Gippsland and the CFA's efforts to control the fire. Gas restrictions that affected 1.8 million households as well as small business and industry across Victorian were applied almost immediately.

The significance of the loss of gas supply did not become fully apparent for up to 48 hours.

Longer term impacts

Longer term and continuing disruptions flowing from the cessation of gas production included changed domestic routines, in particular for cooking, heating and washing; layoffs of staff where industrial plants required gas to function; business disruption and temporary closures where

gas was required for cooking or other services.

By extrapolation we could see that these impacts had the potential to amplify and run out of control if the crisis was not managed and if supply was not resumed within a reasonable period.

Loss of industrial and commercial activity could impact on the enterprises themselves, as well as on the families affected by lay-offs and stand downs and plant closure. Some gas supply infrastructure, industrial equipment and even some domestic heating equipment was potentially affected by loss of gas pressure, by shutting equipment down and by the restart process.

There were potentially long-term consequences for the society and the economy of Victoria.

In particular certain special needs groups such as the frail aged, newborn infants and other required additional support or exemptions from gas restrictions. For these groups gas was an essential part maintain day to day health and safety. Prolonged lack of gas—or in some cases even short-term loss of gas—could have dire consequences.

Overview – responses and support programs

Government response

A 'total system failure' such as the loss of gas had not been envisaged and so was unplanned for in its detail, although existing disaster management arrangements did address some elements of the matter. To ensure that a whole of government approach was applied, to ensure effective communication, proper coordination and appropriate sharing of resources the Government established a Cabinet Task force as well as the Central Government Response Committee. Chaired by the head of the Department of the Premier and Cabinet, this committee was composed of heads or deputy heads of relevant government agencies and the gas regulatory authorities. As well the Government's agencies responsible for gas supply and natural resource management met regularly with the gas distribution companies and Esso to facilitate control of the fire scene and then repair and restore the gas supply.

These arrangements worked effectively at a senior level through a shared sense of purpose and vision generated and driven by the Government.

Maintaining essential services

The critical essential services reliant upon gas were acute care and health services

including hospitals, residential nursing homes and supported accommodation of various types. These institutions needed gas for heating, sterilising equipment, washing of linen and food preparation.

Support to these was provided by an industry coordination centre established by the Department of Human Services (DHS) which worked through DHS regions and the hospital networks to;

- coordinated alternative suppliers or sources of food, cleaning and washing services
- coordinated the rapid installation of alternative power supplies such as diesel power electricity generators
- provided advice and information to institutions and back to Government

This support was coordinated by an industry support centre, established from scratch, at the head office of DHS in Melbourne.

On the gas supply/infrastructure repair side the Department of Treasury and Finance (DTF) and the Victorian Energy Network Corporation (VENCorp) worked with Esso to manage the reduced gas supply and to restore the gas production plant to working capacity.

Providing support services to the community

The task described above were difficult enough in their own right given that an event of this scale, and affecting such a large proportion of the population had not been specifically planned for.

Managing support to the community, one of the arms of the government's response, was even more complex. Some of the salient aspects of this response were:

- the establishment of a community call centre, staffed by over 50 people manning 24 phone lines and running up to 16 hours a day—this centre provide immediate advice to people requiring either information about how to manage without gas or information about their status exempt or not-exempt from the gas restrictions
- the provision of broad scale information to the community about public health issues and safety issues in dealing with food, other putrescible products, hygiene and domestic safety management—this information took the form of public information sheets available on the web and distributed to relevant local agencies, newspaper advertisements and advice and information available through specific officers
- management of a process that on the basis of professional consideration

exempted individuals in need from restrictions on gas use.

Issues in supporting the community

Identifying vulnerable people

In circumstances of restricted resources services need to be directed on a basis of priority. But with little prior understanding of a State-wide utility disruption and less understanding on the range of impacts it was not immediately clear which people, or locations, were at greatest risk.

Need was, to some extent self-identifying when people with special requirements were disproportionate in their enquiries to the community call centre. This self-referral system, supported by Government calls to the public to seek assistance if they required it. It was also allied with the specific professional understanding of different health and community sectors (such as aged care, disability, mental health and public health), soon began to identify broad classes of groups in special need.

These groups, in a very crude ascending order of priority, included:

- people whose businesses were shut down or who were laid off from work because gas use for commerce was restricted; principal issues here were about income maintenance and management of gas restoration to minimise loss to the economy
- people who required additional household implements for cooking or heating but could not easily afford them; these included social security recipients
- people who required special heating arrangements such as the frail elderly and new born infants
- people who needed special water heating arrangements for clothes washing (such as infants and the incontinent) or people who needed a supply of hot water for personal bathing (such as people with significant skins disorders or people with psychological conditions that impelled them to bathe many times a day)
- people receiving 'hospital in the home services', palliative care or who were on life support systems powered by gas.

All these needs were significant and were addressed in a variety of ways.

The extent of these special needs groups and vulnerabilities became apparent within a short space of time.

Embracing these particular groups was the larger Victorian community that required information about the situation and advice on how to maintain day to day activity without gas.

Parallel, but not counter-balancing the

vulnerable groups, was the bulk of the population, generally in good health, with adequate life management skills to deal with a crisis and with sufficient resources to compensate for the loss of gas (heating, cooking and hot water) by resorting to electrical equipment through loan or purchases or with networks that gave them access to resources. For most of these people the loss of gas was an inconvenience.

There is anecdotal evidence—though not corroborated by any systematic study—that the elderly who had weathered the landmark disruptions of war and economic depression or the more personal difficulties of daily domestic life dealt with the stress of life without gas better than the less robust young. As well as being personally more resilient they were more imaginative in the solutions they developed to cope without gas.

Managing the exemption process

Given that some people relied upon gas not for comfort or even convenience but as a life critical health and safety utility ensuring their access to the remaining gas (or to an alternative fuel source) and providing them with support was essential.

The legal and political frameworks surrounding gas were such that specific exemptions were required for people given access to the available gas. Fines had been established for cheating and as well compliance required a transparency to the process to reassure the wide community that, as individuals, they were not being penalised by compliance.

This exemption process was established from scratch and required people with designated medical or health issues to positively seek an exemption by contacting the community call centre and then their need being verified through a nurse or doctor at DHS contacting the person's local general practitioner.

This process worked well, although at times it was cumbersome and time consuming. As the situation progressed and a limited amount of gas became available from New South Wales the exemption criteria were progressively relaxed. Still, exemptions were always provided on the basis of acute medical and health issues.

Managing this process required a large, well managed call centre with over 20 call takers per shift with shifts running from early morning to late in the evening. Calls had to be logged and entered on a database and passed to professional health care worker for contact with the caller's general practitioner.

While this process in itself was not

complex the logistics of managing large numbers of staff, training them, recording data and refining the system in response to changing circumstances required sophisticated management skills, leadership in bringing staff together for a critical purpose.

Coordinating support agencies

Material support was required by many community members including access to community shower, cooking and washing facilities. As well material aid in the form of electric domestic appliances for cooking and heating, as well as blankets, were made available through a number of Statewide non-government organisations (NGOs) to support people who lacked the resources to easily purchase such items.

In addition, information about local circumstances and about how to manage day to day without gas had to be distributed locally. The corollary for this is that locally information had to be gathered, collated and provided to the State Government about local conditions and needs. Existing services, such as Meals on Wheels, were also supplemented to support people in need who were no longer able to cook for themselves.

This required commitment and compliance on the part of the affected municipalities as well as effective coordination by DHS of information flows out from the centre.

This was achieved effectively though using the intermediate government layer of DHS regions, each of which coordinated local government in their own region. The peak municipal body, the Municipal Association of Victoria, also acted as an information channel out to local government and back to Government.

To coordinate NGOs at state level DHS set up a Community Recovery Committee comprised of the major NGOs and relevant Government Agencies. This body developed criteria for providing assistance to people in need and developed equitable processes for delivering that material aid.

This committee also developed and proposed to Government criteria for the distribution of domestic material aid that was jointly funded by the Commonwealth and State Governments.

Managing information

Information management was critical to effective management and coordination of community needs. Public confidence was maintained in part due to the Government's strategy of having only one

peak point of information, the Premier, who provided information that was realistic in its assessment of the time taken to restore gas services and which did not underplay the matter. This strategy of a single authoritative source, which provided information without media spin, helped ensure that the community was informed and helped ensure community cooperation.

Information on practical issues of day to day life management and of maintaining health and safety was distributed through the community call centre, a series for 'fact sheets' prepared by DHS and made available to the media, local government as well as to agencies such as community health centres.

This information was supported by a series of notices in the print media advising about the status of restrictions on the use of gas. Municipalities provided locally relevant information to their constituents.

Advice and information to the health industry was provided through a parallel process situated in an area adjacent to the community call centre. This recorded the status of health and medical centres and coordinated operations to ensure that essential supplies, such as fuel, were distributed efficiently and according to need.

Managing logistics

Managing the detail of establishing a large-scale operation which required the rapid installation and management of information and data management centres necessitated a very considerable logistic effort. The community and health industry call centres were established without prior experience in this sort of event and without the capability of reference to other similar operations in the country.

This management task required a good understanding of community needs and of community reactions to the gas shortage. Initial response depended on the goodwill and commitment of staff and the application of their professional skills and knowledge. For regional and field staff their practical experience, credibility and networks were important attributes they brought to managing community support. This applied particularly in information technology where expertise was required to establish the telephony to manage many hundreds of calls an hour, the development of a local area network to record data on request and exemptions. Other areas requiring particular effort were in scheduling and rostering multiple shifts of staff, briefing

them and monitoring their work as well as ensuring that they were not unduly stressed by the experience. Office management, from acquiring goods, scheduling office supplies and arranging meals was another significant area of work.

At senior level daily DHS Executive briefings and coordination and planning meetings were required, as well as DHS liaison with eth CGRC and the VEMC as well as with agencies such as VENCORP. Media management, and the management of information to the public, which was accurate, timely and not alarming also called upon a range of professional skills.

Lessons

Differential impacts and vulnerabilities

One of the most significant lessons for future crisis and emergency management was that different groups within the community may be affected differentially; they may have different needs which become apparent at different times and these, in turn, require a flexible response.

It was also clear, however, that different groups also possessed different capacities to manage the stress and difficulties of life without gas. These needs and capabilities were not always complementary. The aged, for example, required support for heating but they were also better able to cope with the stress of life without gas than were the young. But their stress management capacity did not reduce their need for heating.

Different parts of the State were affected in different ways, just as different sectors were impacted in particular ways. For example, some people required support because they had been retrenched from businesses that had to close and required income maintenance support. Others needed advice on how to keep their business running using alternative fuels or alternative sources of cooking, heating and cooling.

Resilience and vulnerability

We learnt that some people and households (these people may have belonged to a 'class' of people such as those on life support systems, but they did not belong to a group in so far as a group has strong linkages and communication between its members) were vulnerable in different ways and at different times.

We also learnt that resilience³ was an attribute that, while not counterbalancing vulnerability, was another personal, household and community attribute relevant to successful management of the crisis. Municipal support to residents

through opening up communal facilities for bathing and washing and cooking was helpful to many people. Municipal distribution of information and local identification of people requiring supplemented or additional services (such as Meals-on-Wheels or Royal District Nursing Service support) were other support mechanisms that were critical in managing the crisis and minimising its impacts.

Local support, either through municipalities, community groups or existing voluntary and not for profit agencies was critical in managing community needs but was not relied upon as a sole strategy.

However, this type and level of local support, and mutual support between community members, were critical elements that we need to develop and incorporate in a more planned fashion into existing, formal arrangements.

State level and State-wide planning

Victoria's emergency management arrangements are in a constant state of learning and review and improvement and have proved effective against a range of events of different scales.

However, these arrangements — and I have no indication that this situation is different anywhere else — do not address the issue of dealing with an event that affects the whole state and, by inclusion, the capacity of emergency management agencies. We had planned for events with the implicit but unacknowledged supposition that there would always be 'somewhere else', somewhere outside the affected area from which we could draw support — material resources, staff, alternative accommodation and the like.

When the whole state was affected there was no 'somewhere else'. So Victoria was essentially thrown upon its own resources⁴.

We also learnt that — for community support and disaster recovery at least — that 78 municipal plans and 9 regional plans, even though they cover the entire state and the entire population, do not provide the capacity to manage a State-wide event at State-level. State-level operations for the whole State required supplementary capacities which included; enhanced coordination and command arrangements at state level that applied equally to all parts of Victoria, State-wide information gathering and distributing mechanisms and a robust and adaptive management capacity, supported by appropriate systems and infrastructure, to deal across the State.

This capacity has now been very greatly enhanced in Victoria and is an integral

part of the emergency management and community support arrangements.

The role of emergency management

The gas shortage was an event that differed in significant ways from 'traditional' disasters such as floods and bushfires. For instance, there was little physical damage (except for the tragedy at Longford), for most people there was minimal disruption to their lives; there were no defined and short lived periods such as impact, search and rescue, relief operations and so on.

It was debateable therefore whether the emergency management arrangements were the most effective mechanism to use to support the community. This debate continues. At the time supplementary arrangements were developed and applied to deal with the massive scale of the crisis. The emergency management arrangements supported these but were not central to the response. What emergency management did bring to the issue were:

- established databases of agencies, contacts, skills, expertise and capacities
- initial and local mechanisms for coordination
- networks of contacts, liaisons and linkages
- a knowledge of how to deal with crisis, how to pace the use of staff and management arrangements
- a knowledge of how to be innovative, adaptive and imaginative in developing new ways of managing crisis and supporting the community
- networks and systems for engaging the community and local government
- experience in dealing with critical and rapidly changing situations

These skills and knowledge bases were deployed usefully in supporting and informing Government and senior management and in providing a transitional framework for generating a first response and then leading into more sophisticated arrangements specific to the needs of the community.

Managing exemptions

At the start of the crisis there was a blanket ban on the use of gas. This restriction was lifted progressively as two things became clearer. First, that the residual gas in the distribution system would support a very limited number of people for some time given that community compliance with requests not to use gas was (surprisingly) high and was maintained throughout the crisis. Second, that certain people needed gas for heating, hot water or other purposes as a matter of safety and health.

In this circumstance certain categories of people were, on request to the community call centre at DHS and after verification, allowed to use gas. However, there were some complexities with this process. Identifying the classes of people in greatest need and communicating their eligibility to apply took time and had to be handled sensitively. Particularly since many people felt that potentially they had a need for exemption from the restrictions on gas use.

Once they applied DHS doctors and nurses had to discuss their request with their local medical practitioner, recorded (on database specially constructed for the event), communicated to the gas regulatory authority (VENCorp) to ensure that local inspectors did not disconnect the gas manually or charge the people with an offence, and then relayed to the applicant.

The other complex issue, the one above being complex administratively given the volume of requests and their urgency, was to ensure that equity was maintained and that exemptions were provided on the basis of identified and verified need.

This introduced the notion of vulnerability and opened up the whole range of potential needs and requirements for gas. Criteria based on issues of safety and health were used to determine the categories of need eligible for exemption, such as being frail and aged, being on a life support system, receiving palliative care, requiring frequent bathing for physical or mental health (skin disorders and obsessive-compulsive behaviour).

Community engagement and participation

A community support committee was set up after a short period by DHS which included churches, relevant NGOs, and government departments to advise on community needs, effective ways of communicating with the community and to determine methods of distributing material aid (electrical household equipment or vouchers) to people who met certain income criteria.

This process of involving agencies with local networks, credibility in supporting people in need and with experience and

Notes

3. or the capacity to successfully manage the event, to rebound from the loss or even to mitigate the loss potential in the first place

4. Of course had the situation worsened then it is inconceivable that critical support would not have been made available from the other States and Territories and the Federal Government in a willing and urgent manner.

capability if distributing aid was invaluable.

It was clear that Government networks and information channels need to be augmented by those available to NGOs and other local agencies which truly and effectively reach deep into the community and which, at their base level, are staffed and run by people from the community.

Formal networks, systems and arrangements need local, informal arrangements to deal immediately with the needs of the community. Neither can substitute for the other and both need to recognise what value they each bring to community support.

Uncertainty and adaptability

Perhaps the most important lesson we learnt was that uncertainty is a central element of managing disasters and the bigger the event the higher the level of uncertainty. Uncertainty about when 'normal services' will resume, uncertainty about how people are coping, uncertainty about how to deal with wide area events, uncertainty about information — its currency and its completeness.

To deal with uncertainty a high level of adaptability (innovation, creativity and imagination are adjectives that also spring to mind and are relevant) is required to tailor existing systems or to develop new systems to meet the demands of the practical and immediate needs of the community.

Adaptability requires not just innovation and insight but also the courage and boldness to set aside established practices and policies if they are no longer fully pertinent to the situation, which confronts the community.

Conclusion

These lessons are being applied in Victoria at the moment. Learning from the gas shortage is continuing.

The gas shortage only lasted for a few weeks, but recent electricity outages or potential outages have heightened the sense of urgency, which it fomented. These have required management of a scarce resource and effective public information and communication to prevent a 'situation' deepening into a crisis or disaster.

What Victoria now has is an established, tested and robust infrastructure for supporting the community after utility disruptions; this infrastructure can be applied to any crisis or emergency. This infrastructure is supported by administrative and political decision-making arrangements at a very senior level.

These, and the wider emergency management arrangements, are constantly being

reviewed in the light of operational experience.

This high level of activity and commitment indicates an improved understanding of the range of consequences and the difficulties in managing these if utilities fail or are disrupted. This improved understanding is being manifested in the development of standardised exemption criteria for a range of utility disruption scenarios as well as by the development of specific management and communication arrangements for a range of other utility disruptions.

An area in which I am especially interested, social system vulnerability and resilience, is also progressing on a number of fronts being supported in various ways by DHS, Emergency Management Australia and the Risk and Community safety Research Initiative at RMIT University.

Note

This paper was presented to the Emergencies 2001 Conference, *Strategies for effectively managing your preparation, response and recovery*, Sydney, May 3.

Conference Announcement

Preliminary announcement

'Community Safety and Sustainability in the Pacific'

International Conference

6th–7th May, 2003

11th Pacific Regional Disaster

Management Meeting

8th–9th May, 2003

Nadi, Fiji Islands

Further details including venue and call for papers for the International Conference will be made available in early 2002.

For more information check SOPAC's website

www.sopac.org