

# The Macedon Digest

The Australian Newsletter of Disaster Management

Produced by the Australian Natural Disasters Organisation

Vol. 3 No. 4 - December 1988

## THE COSMOS 1900 INCIDENT

"The nuclear reactor from COSMOS 1900 was boosted into a high orbit on 1 October '88 as advised in our SITREP No. 7. Because this safety mechanism operated there is no longer any radiation hazard from COSMOS 1900".

*(Extract from final NDO signal to all contact officers)*

The above extract of the final NDO message to all authorities involved in the recent COSMOS 1900 incident, was the last episode in a three month long planning saga involving Commonwealth, State and Territory organisation.

Extensive preparations were made by the Commonwealth and the States and Territories, to ensure that if radioactive debris impacted on Australia from the nuclear powered satellite COSMOS 1900, the safety of the Australian people was assured. The risk was assessed at around 2%. Fortunately, an on-board safety system designed to boost the nuclear reactor into a high storage orbit operated successfully, and all agencies were stood down on 1 October. By this time NDO was ready for a major operation.

In 1983, a contingency plan was prepared by NDO to deal with the possibility of impact of radioactive debris from an earlier Soviet nuclear powered satellite, COSMOS 1402. In this instance some re-entry did occur, but its actual nature is unknown, as it landed in the Indian and Atlantic Oceans. The plan, Australian Contingency Plan for Space Re-entry Debris (SPRED), was used successfully as the basis for the recent preparations and all procedures worked well, although some were modified as necessary.

“  
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were made to ensure the  
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people**  
”

NDO was also fortunate to have copies of a comprehensive after-action report, prepared by the Canadian Atomic Energy Control Board, after radioactive debris from another Soviet nuclear powered satellite, COSMOS 954, impacted on northern Canada in 1978. This incident required a major clean up operation which lasted six months. The report was invaluable in providing

background information about the nature of the debris, radioactivity levels, search techniques and so on.

The preparations to deal with impact of radioactive debris on Australia, differ significantly from normal counter-disaster operations conducted by NDO. Normally NDO operates in support of the States and Territories, and only becomes involved when assistance is requested. However, the recovery of radioactive debris is a Commonwealth responsibility, with the States and Territories playing the support role. It is for this reason that a separate contingency plan was considered necessary.

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debris is a Commonwealth  
responsibility**  
”

Ministerial responsibility for space matters lies with the Minister for Industry, Technology and Commerce and specifically in the Australian Space Office. NDO is responsible for co-ordinating any counter-disaster operations which may be needed.

The main participants are:

- ❖ Australian Space Office - Policy matters.
- ❖ NDO - Co-ordinating operations, public warnings and information.
- ❖ Bureau of Mineral Resources - Aerial Search.
- ❖ Australian Defence Force - Provision of the Australian Space Debris Emergency Search Team (ASDEST).
- ❖ Australian Radiation Laboratory & Australian Nuclear Science and Technology Organisation - Technical advice, provision of specialist personnel and equipment to support ASDEST.
- ❖ States & Territories - Initial identification and isolation of debris, passage of information within the States and Territories, including warning.

No contingency plan can cover every aspect of counter-disaster operations, particularly those involving many different Departments. In this instance, after an initial interdepartmental meeting of all relevant Commonwealth authorities, NDO encouraged direct liaison between all concerned to resolve difficulties, with

*Continued on Page 2*



## ACDC PROGRAM

5 February to 30 June 1989

- ❖ Introduction to Disaster Management (1143) 5-10 February
- ❖ CD Planning (1144) 12-17 February
- ❖ Evacuation Management (1145) 19-24 February
- ❖ Introduction to Hazard Analysis (1146) 26 February-3 March
- ❖ Disaster Response Management (1147) 5-10 March
- ❖ Industrial Hazards Workshop (1148) 12-17 March
- ❖ NBC Briefing (1149) 19-23 March
- ❖ Advanced CD (1150) 2-14 April
- ❖ Future Trends in Disaster Clinic (1151) 2-5 April
- ❖ Reserved 17-21 April
- ❖ Advanced Hazard Analysis (1153) 30 April-5 May
- ❖ Schools Curriculum Workshop (1117) 8-12 May
- ❖ Critical Incident Stress Clinic (1105) 8-12 May
- ❖ Introduction to Disaster Management (1155) 14-19 May
- ❖ Disaster Response Management (1156) 21-26 May
- ❖ Hazard Management (1157) 28 May-2 June
- ❖ Costing Disasters Workshop (1158) 28 May-2 June
- ❖ Disaster Recovery Management (1159) 4-9 June
- ❖ CD Planning (1160) 18-23 June
- ❖ Evacuation Management (1161) 25-30 June

Details about these activities are contained in the 1988/89 ACDC Handbook; or contact the College direct on (054) 261205.

## INTERNATIONAL CONFERENCE ON EMERGENCY HEALTH CARE DEVELOPMENT

Washington D.C. 15-18 August 1989

This Conference is being organised by Medical Care Development International in collaboration with the U.S. Public Health Service, the Pan-American Health Organisation, the Federal Emergency Management Agency and the UN Disaster Relief Office. The Conference will focus on issues related to the development and upgrading of emergency health care services, on a world-wide basis. The goal is to achieve a consensus on a world concept of emergency health care, that is not limited to Western-oriented, technologically defined emergency medical services. The conference is open to all emergency health care professionals and planners/managers of health care services. Further information from EHC Conference MCD International 1742 R St N.W., Washington, D.C. 20009, USA

## DISASTER REPORTS

The Australian Overseas Disaster Response Organisation (AODRO) has decided to update the information service it provides on major new disasters. AODRO will now provide to all its members, information in three forms:

- ❖ Situps - current and detailed information about quick-onset disasters in primary regions of interest to Australian NGO's.

- ❖ Weekly Summaries - summary information about major disasters around the world during each week.
- ❖ Situation Summaries - summaries produced from time to time or on request, covering major, generally progressive creeping disasters of concern to AODRO members.

## VIATEL

In TMD of September 1986 (Vol. 1. No. 3), readers were informed that information about College history, courses and publications could be accessed through Telecom's Viatel service. Due to low demand and usage of this service, the College has withdrawn from Viatel. Information about College activities can be obtained by contacting the College direct at the address shown at the bottom of page 8.

## CRITICAL INCIDENT STRESS DEBRIEFING

An international conference on Dealing with Stress and Trauma in Emergency Services, was held in Melbourne in August 1988 (see TMD, Sept. 1988). At the conference, one of the Keynote Addresses, Professor Beverley Raphael of the University of Queensland, said that there needs to be a comprehensive framework established for Critical Incident Stress Debriefing (CISD) within Australia. At present the only Australian team is based at the Social Biology Resource Centre in Melbourne. She said that mental health workers must be able to confront the stresses that emergency services workers face.

Australia has not yet developed CISD to the stage where adverse effects on emergency service workers have been significantly reduced. This is well illustrated by the work of Dr. Sandy McFarlane from the Flinders University of South Australia, into the effects of "Ash Wednesday" on firefighters, which showed that adverse effects were still evident many months later.

## THE COST OF DISASTERS

A comparison of the costs of disasters between countries is often difficult to establish. In TMD Vol 1. No.3, September 1986), the most costly Australian disasters in terms of insurance loss were listed. They were:

Event & Date	Insurance Loss (1986A\$)
Darwin, NT, 1974 (Cyclone "Tracy")	506,000,000
Brisbane, QLD, 1974 (Floods)	198,000,000
VIC & SA, 1983 (Ash Wednesday Fires)	196,000,000
Brisbane, QLD, 1985 (Storms)	180,000,000
QLD, 1973 (Cyclone "Madge")	90,000,000

By way of comparison, FEMA in its Sept/Oct 1987 Newsletter, detailed major US disasters over the past three decades. The five most costly by way of gross federal government obligation were:

Event & Date	Obligated Costs (US\$)
Hurricane, Pennsylvania, 1972	351,500,000
Hurricane, Alabama, 1979	188,900,000
Earthquake, California, 1971	187,000,000
Floods, Pennsylvania, 1977	128,900,000
Floods/mudslides, California, 1983	123,200,000

# COMPUTER MANIPULATED CENSUS DATA AND DISASTER MANAGEMENT

*By John Salter and Michael Tarrant, of the Australian Counter Disaster College*

## Introduction

A valuable definition of disaster for hazard managers is that which focusses on their being "the interface between an extreme physical event and a vulnerable human population" (Susman, O'Keefe & Wisner 1983). We too often inherit a legacy of management which overemphasises the characteristics of the physical event. From such analyses, managers can develop various strategies which aim to prevent/mitigate disasters through a range of interventions, such as engineering, land use regulation etc. A too often overlooked area of intervention opportunity is provided by the potential to analyse the nature and characteristics of the population at risk. An integrated framework, illustrating some connections between hazard and community analysis for developing management strategies is outlined in figure 1.

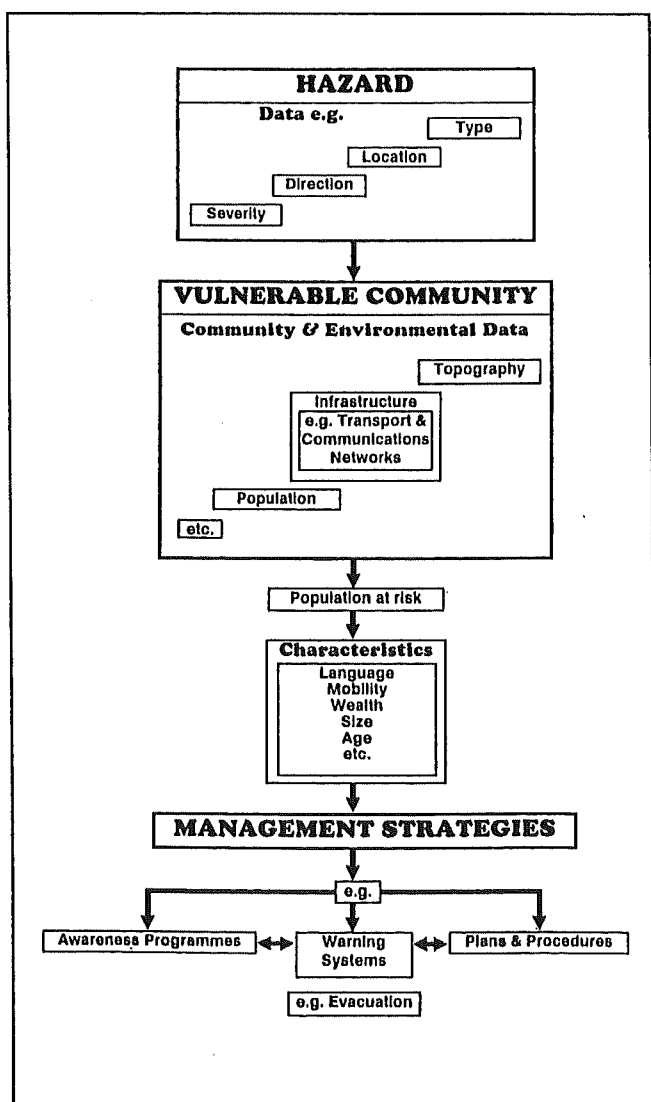


Fig 1: A Community Analysis Framework

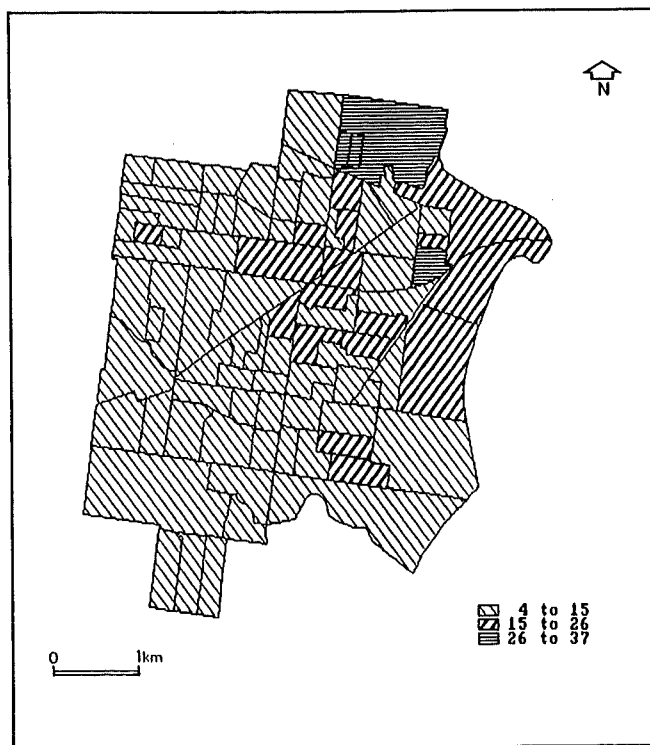


Fig. 2: Percentage of population who are not competent speakers of English

Such analyses can be enhanced by the use of census data held on a compact disc accessed by a personal computer using "Supermap" software (produced by Space Time Research Pty. Ltd. and currently available for Australia, Hong Kong, New Zealand and The United States of America.) To illustrate this approach we will discuss its particular applicability at a micro level for a dam break scenario in Canberra; and its general value in providing an appreciation at macro level of a inner urban community within Melbourne.

## Macro level: Footscray industrial area of Melbourne

Adjacent port facilities and industrial sites provide an environment with a range of technological hazards associated with processing, storage and the regular transport of hazardous goods. This area has a population in excess of 45,000, and consists of 85 Collector's Districts (C.D.'s).

Planning of disaster managers can be enhanced by appreciations of patterns depicting relevant community characteristics. The census offers over 1,000 items of information, grouped in 43 fields. Many of these fields are of value for consideration, such as that depicted in figure 2 which was generated using "Supermap" software.

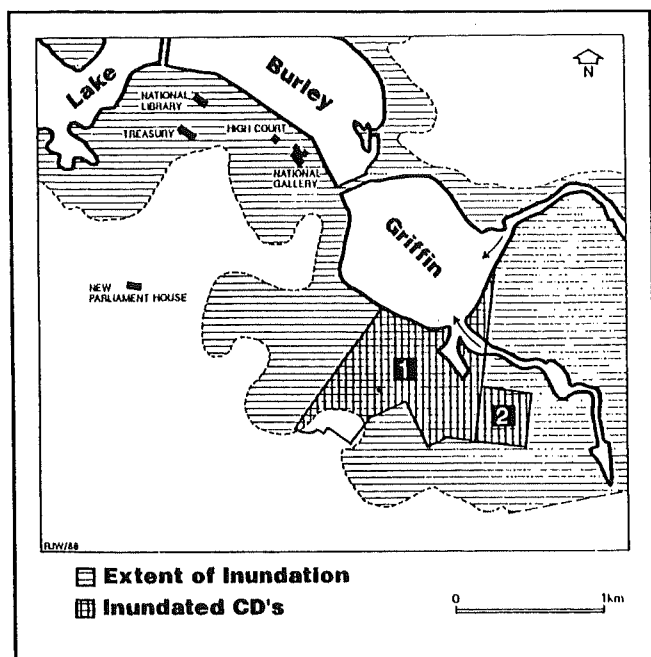


Fig. 3: CD's/Inundation areas for a dam failure above Canberra

### Micro level: Canberra dam break

Research by various agencies (e.g. Hydrology and Water Resources Unit of the A.C.T. Water Administration and the Centre for Resource and Environmental Studies of the Australian National University) indicates that a low probability but high impact event may occur if the Googong Dam fails. The predicted areal extent of this event has been mapped. A selected part of the predicted impact area is shown in figure 3. The chosen area contains two C.D.'s which are the basic units for the gathering of census data. These C.D.'s (Nos. 014301 & 014302) are superimposed on the predicted area of inundation in figure 3. Each C.D. reflects differing characteristics which require analysis by disaster managers. Some of the community characteristics appropriate for consideration are listed in table 1.

Collector's Districts (CD's)	1	2
1: Total Population	407	132
2: Same Residence 1985	46	91
3: % Same residence 1981	14	62
4: % Poor English Speaking	1	2
5: % High Density Residential	14	28
6: Children < 11 yrs old as % of population	7	12
7: Single Parents as % of population	1	6
8: % of households with income < \$15,000	4	11
9: % of households with income > \$32,000	25	0

Table 1: Census Data 1986 Canberra

### Conclusions: General applications

It has become generally accepted that information about the nature of vulnerable communities is essential for effective disaster planning. One limited, but nevertheless significant indicator is census data. This is a particularly valuable source now that it can be accessed and manipulated with speed and ease via "Supermap".

"Supermap" census data is stored on one compact disk. This disk holds all of the information on Australia's population of 16,000,000 for the 1981 and 1986 census. As such it represents a comprehensive data set. From this broad data base the user can manipulate and select data as need or whim dictate. A general picture for a selectively defined and extensive area can provide a macro view, or a selection of only a few Collector's Districts can provide a micro insight. The software is not only easy to use, but is also designed to allow the incorporation of other user defined data via a merge capability. As with most computer technology, the above can all be done quickly, especially compared to the more dated methods involving magnetic tapes and Fortran software. The statistical representation and output of manipulations can be in either table or map form, which further facilitates consideration and analysis. At the "bottom line" of resourcing, cost need not be an undue restriction as the data and software are available for less than \$A4000.

It has always been recognised that information is the keystone to disaster management. "Supermap" presents us with new ways to analyse "old" data more efficiently and effectively.

## HUMAN RISK PERCEPTION

by Pam Millican, ACDC

It may be claimed that the public generally under-rates the risk within their environment. Why?

Literature suggests that the public lacks knowledge of and underestimates the hazardous quality of their environment. This statement is based on the assumption that "people are people", all having a variety of daily activities and occupied with the business of living. This often precludes their interest in identifying, taking precautions against or responding to existing hazards.

Difficulties exist in gauging risk perception, because of the problems in structuring suitable questions which will determine more clearly the individual's level of risk perception.

Relative to other existing community problems, *natural* hazards are identified only infrequently by the general public as potential hazards. This is in contradiction to the generally held precept that, as western society becomes increasingly technologically complex, the vulnerability caused by events of low probability, but high disruption, increases. Currently there appears to be a lack of clarity regarding hazards and individual awareness, and in many instances forms of mitigating action which can be taken at individual level to reduce the possible impact.

White (1974) states that variations in hazard perception can be accounted for by a combination of:

### **1. Magnitude and frequency of a hazard**

Perception of risk is directly related to whether the individual has had actual hazard experience and what time frame has elapsed since the hazard impact. However experience does not appear uniform in its impact. Some people have an inversed attitude, typical of many Australians, that once a hazard has impacted upon an individual it is not likely to happen again. "Lightning doesn't strike in the same place twice".

### **2. Recency and frequency of personal experience**

Hazards and intermediate frequency generate the greatest variation in hazard interpretation and expectation. The length of time between the hazard occurrence certainly influences intensity of perception e.g. People interviewed after the 1893 flood in Maryborough Qld and reported by the Maryborough Chronical, considered it to be the one in a life-time event. However, an old Aborigine interviewed was able to tell stories about much higher water levels, which occurred just before white pastoralists moved into the area.

Oliver, J. 1975 states in reference to northern Australians living in the cyclone belt: "...long intervals between individual cyclones may encourage people to be lulled into a sense of false security... in an area in the process of being opened up a considerable proportion of the population are relative newcomers. They have little or no experience of cyclone... Those who have been on the periphery of a severe storm will have a false confidence about their ability to deal with a cyclone."

### **3. Importance of the hazard to income or location.**

The physical distance between the individual's domicile and the centre of hazard impact will lessen acuteness of perception. Closely akin is the impact made on income. If the threat is gauged to cause a reduction in income, either dramatically or to a lesser degree but over a long period of time, perception is heightened. However, inversely there are individuals who see potential income in hazard management and in the response and recovery phases, following the impact of a hazard. This will also result in a heightened awareness of the elements of risk.

### **4. Personality factors such as the individual's risk-taking propensity, fate control, and views of nature.**

Draybek 1986 suggests that other variables which influence hazard perception are:

- ❖ Age (scepticism regarding personal vulnerability varies with age).
- ❖ Ethnic differences and associated cultural milieu.
- ❖ Occupation.
- ❖ Socio-economic/education levels.

### **5. First hand experience of hazard impact**

This is important but one does not need to be a direct victim to have the experience. e.g. many people can recall events such as Cyclone Tracy because they had friends, relatives involved. More importantly the media gives

graphic, but sometimes sensationalised accounts of hazardous events.

### **6. Causality also limits hazard perception but to a lesser degree.**

Victims of a fire consistently indicated higher probabilities for future fire damage than did nonvictims (Parker, Brewer and Spencer 1980).

### **7. The individuals perception of hazards reflects the simplicity of a one to one reaction.**

Will it happen? When will it happen? What is the likely effect on me and my immediate family? How do you know?

Questions such as these, unless an individual has had recent hazard experience, will strongly influence their perceptions of hazards likely to impinge on them. Levels of individual risk perception are difficult to quantify. However, with an ever increasing population living in hazard prone areas, the need to increase awareness of, preparedness for and knowledge of response and recovery, is assuming greater importance in disaster management.

### **References**

- Draybek, T.E. (1986) Human System Responses to Disaster: An Inventory of Sociological Findings, Springer-Verlag New York.
- Oliver, J. (1975) The Significance of Natural Hazards in a Developing Area: A Case Study from North Queensland, Geography 6 099-110.
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- Saarinen, T.F. and McPherson, H.J., Flood Plain Dwellers Perception of the Flood Hazard in Tucson Arizona, The Annals of Regional Science 11 July.
- White, G.F. (1974) (ed) Natural Hazards Research Concepts, Methods and Policy Implications, pp3-16 Natural Hazards; Loca, National, Global New York Oxford Uni Press.

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## **GREENHOUSE EFFECT**

The Guardian Weekly (Vol 139 No 8 of 21 August 1988), outlines the huge costs which will occur in a Greenhouse world of the 21st century. For example:

- ❖ it will cost between US\$10 billion and US\$100 billion to protect America's east coast shore lines;
- ❖ several billion dollars will be required to repair and maintain Holland's fragile coastal infrastructure, if sea levels rise by one metre,
- ❖ retooling dams and irrigation systems in the U.S. will cost between US\$7 billion and US\$23 billion and
- ❖ total world irrigation needs may require a US\$200 billion outlay.

But many of the greenhouse effects can be reduced if energy efficiency programs are introduced. In the U.S., a nationwide energy efficiency program (which would greatly reduce carbon dioxide levels), would cost approximately US\$50 billion, but it could save US\$110 billion per year in energy expenses - a net reduction of US\$60 billion each year.

## PUBLICATIONS

### Nuclear Winter

Copies of "Beyond Darkness: Nuclear Winter in Australia and New Zealand", are still available from the author, Dr A Barrie Pittock. The Canberra Times said of Dr Pittock's book, "Readers who wish to inform themselves about the central issue of our time could scarcely do better than start with Pittock's book." Copies can be obtained by sending \$10 cheques to Dr Pittock at:  
38 Yackatoo Avenue,  
Aspendale, Victoria, 3195,  
Australia.

### NDO/ACDC Publications

Three publications have recently been produced by the Natural Disasters Organisation and the College. They are:

1. A pamphlet about **Severe Storm** jointly produced by NDO and the Bureau of Meteorology. This pamphlet provides a variety of factual information and necessary precautions. It defines a severe storm, indicates the causes, and outlines associated weather phenomena such as hail. It also looks at the frequency and severity of severe storms and mentions the Bureau of Meteorology warning system. General safety precautions and specific precautions against lightning strikes are outlined.

2. A **Workshop Report on Local Government and Disaster Management**. This report, which emanated from an activity at ACDC in mid 1987, includes coverage of the roles of local government in disaster management, education and training needs, particular needs of the States, strategies to meet the needs and evaluation.

3. A **workshop report on Disaster Recovery - Public Health Aspects**. This report summarises a workshop held at ACDC in March 1988 and lists recommendations for public health aspects of disaster recovery, as papers given and sessions conducted and a list of background material presented to the workshop.

Two further reports are currently in production and should be available by early January. They are the report of the **Research Workshop on Economics of Disaster**, held in April 1988, and the full report and papers of the **Toxic Chemical Incidents Symposium**, held in October 1987.

All of the above publications are available from:  
Australian Counter Disaster College,  
Mt. Macedon, Victoria, 3441,  
or  
Natural Disasters Organisation  
PO Box E33,  
Queen Victoria Terrace,  
Canberra, ACT 2600).

### Disaster Support and Recovery

A recent edition of "The Australian Child and Family Welfare Journal" (Vol.12, No. 3), is devoted entirely to articles and other material on disaster support and recovery. Topics covered include "Community Recovery following the Ash Wednesday Bushfires", "Some Considerations in Planning for and Managing Community Recovery following Disaster," and "Personal Services".

### Flood Booklet

"Assistance after the Sydney Floods of August 1986".  
Copies are available for \$3.50 from:  
The Children's Bureau of Australia Inc.,  
PO Box 629,  
Cheltenham,  
Victoria, 3192  
Australia

### Managing Disaster

A new publication from Duke University Press is "Managing Disaster". This book reflects an important shift in the definition of disaster, moving from the "Acts of God" approach, to an examination of the interrelationship of disasters with natural hazards and human systems. To address the need for a reassessment of strategies and policy direction and also the need for a new approach to the teaching of this subject at tertiary level, "Managing Disaster" presents the work of twenty-two active professionals and scholars in the field. Areas covered include the policy problem, mitigation, preparedness, response, recovery/reconstruction, policy issues in the international context and integrating emergency management.

For information about this book (US\$17.95 in paperback) contact:

Duke University Press,  
6697 College Station,  
Durham,  
North Carolina,  
U.S.A, 27708

### Disaster History

"Disaster History," which is compiled by the US Office of Foreign Disaster Assistance (OFDA), is updated periodically and reprinted annually. It provides information on major disasters which have occurred around the world since 1900. Information is more complete on events since 1964 and from the Australian perspective, it only covers the period 1967 to 1986. No information is provided on disasters which occurred within the United States and its Territories (this is provided by another US agency, the Federal Emergency Management Agency). Specifically, information provided includes dates, region (eg Pacific), country, type of event, fatalities, affected persons, homeless, damage bill and specific comments. Data can be retrieved from the OFDA's database by a variety of selection criteria, including strike data, region, disaster type etc. For example, if you are interested in a list of storms that occurred in the Pacific since 1970, a printout can be generated upon request.

For further information about either the publication "Disaster History" of the OFDA data base, contact:

OFDA,  
Agency for International Development,  
Room 1262A,  
NS,  
Washington, DC,  
USA 20523



### United Kingdom Database

The Major Hazard Incident Data Service (MHIDAS), a data base emanating from the United Kingdom, was recently launched. It has been set up to identify potential dangers in handling hazardous materials and carries more than 10,000 items of information about separate incidents. It is being jointly funded by the United Kingdom Atomic Energy Authority's Safety and Reliability Directorate, and the Health and Safety Executive (the British health and safety inspectorate).

The aim of the database is to collect information on the hundreds of incidents which occur each year, whether major (like Bhopal) to smaller ones affecting only small numbers of people. The information obtained, will enable the identification of possible dangers and allow more precise risk assessment, thus making industrial installations safer and more reliable.

The database can be searched in many different forms, eg the number of persons affected by toxic incidents in a particular country, or details of pipeline failures around the world.

Enquiries about the database to:

Head of Major Hazards and Transport Group,  
UKAEA,  
Safety and Reliability Directorate,  
Wigshaw Lane,  
Culcheth,  
Warrington, WA3 4NE,  
United Kingdom

### London Underground Station Fire

Two doctors who were involved in the emergency care of victims of the recent London Underground fire at King's Cross Station have provided the British Medical Journal (Vol 295, 28 November 1987) with their personal views of the tragedy. They recounted:

"Twenty four hours later now and the horror of it all just will not go away. We almost wish we'd never got involved. Politicians visit the scene, the recriminations begin. How easy it is with hindsight to foresee the problems, but none of the discussions will help the dead.

Can any medical lessons be learnt? For almost an hour we and several others were the only doctors there. Should a properly equipped team have been sent straight away? Perhaps it could have done no more, but there did seem an urgent need for someone with experience and authority to triage the dead and injured. Many of the dead went to hospital in ambulances while the injured sat on the roads waiting for their return".

### Flood Warnings and the Law

Following a major flood in Cardiff, Wales, some of those flooded sued government authorities for failing to issue flood warnings. The flood was detected by the Welsh Water Authority many hours before it peaked in Cardiff. However, essentially because of the absence of clear responsibility for decisions concerning warning dissemination, the floodplain public were not warned. The court found that the authorities had been negligent and were liable for damages resulting from the lack of warning. The legal arguments used are probably just as applicable in Australia as in Wales. A detailed report on the case and its implications for Australia will appear in the next edition of TMD.

### Project-P introduced in New Zealand

The New Zealand Chamber of Commerce, in conjunction with the Ministry of Civil Defence, has introduced Project-P, which will assist business to plan for any emergency situation which it may be exposed to. Project-P is to be a program for raising awareness about why a plan is needed in business; a failure to plan means a company may not be in a position to bring to bear, the resources it needs to deal quickly with a crisis. In addition, time and money is wasted trying to catch-up with events after the damage is done. For further information about this innovative scheme, contact:

Jim Rowe,  
The New Zealand Chamber of Commerce,  
Commerce House,  
126 Wakefield Street,  
Wellington, New Zealand

Additional copies of TMD or changes of address: please complete and return this section to the College.

Name .....

Address .....



\* Contributions are welcomed and should be addressed to:

The Editor, "The Macedon Digest", Australian Counter Disaster College,  
Mt. Macedon, Victoria, 3441, Australia.

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