

Survival of Lifelines
in
Earthquakes



Proceedings of a seminar held by the
Australian Earthquake Engineering Society
at

The Institution of Engineers
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Foreword

This volume of the proceedings of the Canberra seminar is the third published by the Society following on from the equally successful seminars in Sydney in 1992 and Melbourne in 1993. The titles of the earlier seminars were *Earthquake Resistant Design and Insurance in Australia* and *Earthquake Engineering and Disaster Reduction*.

The Society distributes a quarterly newsletter to members and IEAust and these seminars are held annually in accordance with the objectives of the Society to promote and advance the practice of earthquake engineering and engineering seismology. The 1995 seminar has been included in the Pacific Conference on Earthquake Engineering co-hosted by the Australian and New Zealand Societies which will be held in Australia for the first time, in Melbourne in November 1995.

A damaging earthquake in Adelaide in 1954 did not seem to raise the awareness of the community to the potential risk of earthquakes in Australia, despite the earlier deaths of two South Australians from heart attack during an earthquake near Adelaide in 1902. The Society was almost born after the Meckering WA earthquake when an earthquake committee was formed to write the first earthquake code, but it remained in gestation until induced by the greater shock of the 13 deaths in the 1989 Newcastle earthquake. As the Australian population grows and the urban areas spread, the risk of earthquake disasters grows in step.

Planning and preparation for the next disaster have progressed since 1968 and 1989, now there is a loading code AS1170.4 which is called up by the Australian Building Code throughout Australia. Buildings should not collapse if built according to the guidelines of the code which is based on the principles of earthquake engineering. As Newcastle showed so dramatically, the rescue and recovery phases of the disaster are also important and will remain so since the new code only covers new buildings, the old ones are just as vulnerable as before.

The maintenance of lifelines is extremely important in this recovery phase, to keep open access for emergency services; police, ambulances and firefighters, to ensure supply of power and communications. The theme of this the third Seminar *Lifelines* was decided by members at the 1994 Annual General Meeting of the Society in Melbourne. The Meeting elected the following executive until the 1995 AGM:

President	Mr Charles Bubb	Consultant
Hon Treasurer	Mr David Rossiter	Maunsell Pty Ltd
Hon Secretary & Editor	Mr Kevin McCue ¹	Australian Geological Survey
Committee	Prof Graham Hutchinson	Melbourne University
	Mr John Wilson	Melbourne University
	Dr Michael Griffith	Adelaide University
	Mr Gary Gibson	Seismology Research Centre
	Mr Russell Cuthbertson	Queensland University

¹ National Delegate to the IAEE

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Preface

The AEES is a Professional Society of the Institution of Engineers which influenced our choice of a venue for this year's Seminar, the Institution of Engineers building in Canberra. The Australian Geological Survey Organisation also provided substantial support for the holding of the Seminar.

The sixty participants were welcomed by the Society President Charles Bubb who opened proceedings and chaired the first formal session. Registrants came from all States except the Northern Territory, ironically the most seismically active of all the States and Territories since 1986.

The scene-setting talk on lifelines in the Nation's Capital was to have been given by Dr Mike Sargent, Chief Executive officer of the ACT Electricity and Water and an ex-President of IEAust, but he was called elsewhere and Bob Gibbs stood in for Dr Sargent.

The papers were stimulating, none more so than that from the only non-engineer/seismologist present, Maree Callaghan Mayor of Cessnock. Her frank account of the information-void experienced by the Cessnock City Council in the critical hours and days following the 1994 Ellalong NSW earthquake was moving. Changes to the chain of post-disaster communications have already been set in motion. The discussions by Hasso Constantin of Telecom's control over the relative volume of in-coming and out-going phone calls during a disaster, and of the redundancy in the web-type telephone network that is in place in Australia were revealing. It is a pity the text is not available.

Rod Caldwell showed some dramatic pictures of the damage to an electricity switchyard during the Newcastle earthquake and praised the electricity workers who repaired the high voltage equipment so quickly. He also discusses the consequences of this lack of power. Greg James pointed out that Canberra consumers are served via a single electricity distribution station and there is only a single natural gas pipeline to the Capital, yet in October 1995 the Canberra disaster plan had not been published.

Other topics in earthquake engineering or seismology were addressed, most of them having some bearing on the theme of lifelines.

Speakers were asked to provide a transcript of their papers but the deadline came and went with only half the papers in hand. A final deadline had to be set for the proceedings to be printed in time for the PCEE and unfortunately 3 of the papers had not been received by that date.

The organising committee would like to thank all the participants, especially those who presented papers, and more especially those who provided the transcripts.

Kevin McCue

Charles Bubb

David Rossiter