



Bill, I shall get your subs via 1/6/92
 T. E. Bost, Thanks
 David Rossiter

ASC, GPO Box 378
 Canberra ACT, 2601. fax: 06 248 0913

Australian
 Earthquake
 Engineering
 Society

AEES Newsletter

No 1/92

The Society

David Rossiter

Membership is now officially 55, however the Institution has indicated through its annual membership fee system that a further 77 Institution members are interested in joining the AEES. We will be contacting them over the next few months. If you know of persons interested in joining AEES please contact us, or ask them to contact us at the above address..

Contents

The Society	1
President's column	1
AGM, election & conference.....	1
AEES Annual report 1991.....	2
News items	3
Liquefaction, a local example.....	3
First South Australian accelerograms	4
Recent Australian earthquakes.....	4
Courses & Conferences	4
Earthquake publications	5

Presidents column

Charles Bubb

I want to raise some rather general matters which we could perhaps discuss during our forthcoming conference in Sydney.

In Australia, indeed everywhere it seems, rapid change has become the norm. Our society and the structure of our organisations are changing around us as we work. Many public sector functions are being privatised or run by commercial principles, while others are reduced in scale or discarded.

I suggest these changes are being made often without a deep knowledge or understanding of the organisations and their functions or the interaction between them. In addition, in Australia, we have the disadvantage of three levels of government between which the buck may be passed endlessly. As a consequence there are functions, important to the community, which may get lost in the shuffle.

The constant drive for economies and cuts in services tends to eliminate the long term view. More and more the urgent displaces the important.

I have in mind two areas particularly important to our discipline of earthquake engineering which could be affected by these trends. The first is the collection of data. The second is the interpretation and processing of it.

Data which is not collected is irretrievably lost. Yet it is not seen as really important in the increasing competition for funds and grants. Without data we cannot do our work. If we do not have it, we must invent it. In other words - guess. The penalties for guessing wrong are being treated more harshly by the community.

To serve the community properly without doing ourselves a disservice, we must find someone in these three levels of government to pay for the collection of data for community use.

This brings me to the second point, namely the interpretation and processing of data. Processed data is more easily seen as having commercial or present value as compared with raw data. Consequently it may be placed beyond the reach of community use by the processes of privatisation or commercialisation of government functions. Again we must ensure that the community, through ourselves, has the necessary access.

Our September conference will enable us to consider these and other matters and give voice to our concerns through the Australian Earthquake Engineering Society. Please consider!

AGM, Election & Conference

The Australian Earthquake Engineering Society and Specialist Group on Solid Earth Geophysics are co-sponsoring a one-day meeting and AEES/AGM in Sydney. The meeting and election are necessary under the Society rules.

Members of the AEES have a broad spectrum of interests in earthquakes and their effects on people, whereas the SG² is more concerned with what earthquakes can tell us about the dynamic earth on which we live. This was a unique opportunity for the Societies to get together on a topic of mutual interest and share the financial risks.

A large part of the time will be left for registrants to mingle informally; it is not often we get the chance to discuss engineering seismology issues with colleagues in other specialties.

Earthquake Resistant Design and Insurance in Australia

Institution of Engineers, North Sydney
Friday
25 September 1992

Program:

8:30 - 9:00	Registration
9:00 - 9:20	Introduction
9:20 - 10:00	Earthquake seismology
10:00 - 10:30	Morning tea/Informal discussion
10:30 - 11:30	Earthquake seismology
11:30 - 12:00	Earthquake engineering
12:00 - 13:30	Lunch/Informal discussion
13:30 - 15:30	Earthquake engineering
15:30 - 16:00	Afternoon tea/Informal discussion
16:00 - 17:00	Earthquake insurance
17:00 - 17:30	Discussion forum/close
17:30	AEES inaugural AGM
19:00	Dinner
20:30	Address

A draft agenda for the AGM is outlined below. The main item of business is the election of a new executive. The present committee is prepared to stand for

another 12 months to see the Society through the establishment phase but an expanded committee is another possibility you may wish to discuss.

AEES ANNUAL GENERAL MEETING

DRAFT AGENDA

- President's Report
 - Hon Secretary's Report
 - Hon Treasurer's Report
 - Election of executive
 - Close
-

ELECTION

PLEASE FORWARD NOMINATIONS FOR THE POSITIONS (to Hon Sec):

PRESIDENT,
HON SECRETARY,
HON TREASURER,
EDITOR.

Will you attend the AEES meeting in Sydney on 25 September?
--

To give us some idea of numbers please complete and send me (Hon sec) the following

I plan to attend (please circle)

the Conference	√
AEES/AGM	√
dinner	√

name

AEES Annual Report Year Ending 30 November 1991

This was the inaugural year of operation of the Society which was formed as a technical society of the Institution of Engineers Australia in January 1991.

Initial membership, the founding executive, was three consisting of:

President: Mr Charles Bubb

Hon Secretary: Mr Kevin McCue

Hon Treasurer: Mr David Rossiter

Membership had increased to 45 by 30 November and is growing quickly, with a goal of 100 members by the end of 1992. David Rossiter has set up a database of members.

The committee met seven times during 1991 and produced two newsletters which were distributed to all members and the Institution. An attractive logo and letterhead were also designed.

Kevin McCue attended the Pacific Conference on Earthquake Engineering held at Auckland, New Zealand. AEES provided \$100 towards McCue's expenses of \$2573 paid by BMR, and requested he establish formal ties with the New Zealand National Society for Earthquake Engineering. This resulted in a proposal that the next Pacific Earthquake Engineering Conference be jointly sponsored by the AEES and NZNSEE, and be held in Australia in 1995. The executive have endorsed this decision and written to the NZ body for formal agreement.

The Society has formal ties with the International Association of Earthquake Engineering which has approved Kevin McCue as the new Australian Delegate following the retirement of Charles Bubb. Charles was delegate for the maximum period of two four year terms. Kevin deputised as National delegate at the last IAEE conference in Tokyo and Kyoto, Japan in Charles' absence, and will attend the Madrid Conference in July 1992.

David Rossiter has established cheque and savings bank accounts at the Commonwealth Bank, Curtin; any two of the executive are required to sign transactions. As at 30 November the balances were as follows:

Savings Account*	Balance \$4266.98
Cheque Account	Balance \$ 459.51

* includes establishment grant from IEAust.

News items

• The *final* draft Australian Standard DR 91094 S: part 4 of Design Loads, will be

circulated for committee comment in May with publication in August 1992.

• Proceedings PCEE '91 are now available. The 1120 page 3-set volume contains the 87 programmed papers, 3 on the 1989 Newcastle earthquake, and addresses of the keynote speakers on theme issues; Microzoning, Non-structural elements, Areas of low seismicity and Reinforced concrete design. Price NZ150.00 incl post. from: NSNEE, PO Box 17-268, Karori, Wellington, NZ.

• A video of the effects of the October 1989 Loma Prieta earthquake is available on loan to members at IEAust, Canberra.

Liquefaction - a local example

Liquefaction is the process that occurs in a saturated confined silty sand (or similar soil) during or immediately after an earthquake when the pore fluid pressure increases to the point where the effective stress becomes zero with a resultant loss of bearing capacity. Sand boils and massive foundation failure are typical indicators that liquefaction has occurred.

Extreme effects such as those shown in the photograph below from Niigata, Japan only happen in major earthquakes (magnitude 7.5 or more) where there are many cycles of shaking. Such extreme effects would not be expected in Australia where no onshore earthquake has exceeded magnitude 6.9. None were observed in the Newcastle or Meckering earthquakes. Minor effects have been noted on two occasions, in 1897 (SA) and 1903 (Vic) and reproduced for your interest is a letter to the Editor of the Adelaide Advertiser dated 13 May 1942:

‘Sir - the tenth day of June is often referred to as *earthquake day* in the Kingston district (SA) by people who vividly remember what happened on that day 47 years ago*. Early in the afternoon my two brothers and I were setting rabbit traps, when suddenly a loud booming noise seemed to come from the burrows, and although there was no wind, the trees began to sway badly. We were so scared that we made a wild rush for home, the Barooka homestead, half a mile distant. On entering the fruit garden on the side of the hill, we found the well, about 15 ft deep, overflowing and flooding the garden. The water was stained yellow by a fine sand which we had never seen before. At the homestead the chimneys were

down; the gable ends of the house stood out; the lathe and plaster ceilings, pictures, and glass were lying broken up. That night and for many more we had to sleep in an old iron house; and at intervals there would be a boom in the direction of Cape Jaffa, and tremors passed under us travelling easterly. These tremors paid us visits at various times for the next three years. That low country on the Kingston-Robe road, known as the Wangolina and Barooka flats, was flooded on May 10, not by rain but by water that was squeezed up through the ground. The same thing happened with the rabbit burrows; the water rushed out of them, carrying with it the same fine yellow sand. In several places, the earth and stone were blown out. Other homes that suffered badly were those of the late Mr T Smith and Mr T. P. Flint; the latter a new stone house, was almost levelled to the ground. Mr Nicol Smith of Cape Jaffa, then a baby was buried and had a narrow escape. - I am Sir, &c., EDW, W Goode
The Snuggery, Kingston, S.E.'

* (Ed The earthquake was on 10 May 1897, 45 not 47 years ago.)

First South Australian accelerograms

David Love

SA Dept of Mines and Energy

Not to be outdone by Queensland (last issue), a microearthquake survey at Moralana in the mid-north of South Australia recorded 22 accelerograms in just 18 days.

Moralana (west of Wilpena Pound) has experienced hundreds of small earthquakes following events of magnitude 3.3 and 3.5 on 30 November 1991. With activity appearing to continue, it was decided to mount an aftershock survey in early February. Five analogue and four digital stations were assembled from our own equipment, with contributions from Flinders University, Phillip Institute of Technology and the Australian Seismological Centre (who loaned the accelerometer).

Hundreds of events were recorded by the analogue stations with magnitudes from about -1.0 to 1.6. 180 digital seismograms were recorded. The accelerograms ranged from 0.0001g to 0.0033g, the largest from a Richter magnitude 1.6 earthquake at a distance of about 7 km. (Obviously one would not want to scale this up to estimate 3.3g from a magnitude 4.6!) The duration of the peak acceleration is only a fraction of a second at a frequency of around 25 Hz.

The total field costs were about \$4000 and data processing will take some months.

If each seismological group in Australia had a few accelerographs and the budget and manpower to mobilise quickly, a wide range of accelerograms would soon be collected*.

* (Ed In a 5 year period, representative accelerograms from several magnitude 4 - 5 earthquakes should become available).

Recent earthquakes

The following table summarising recent Australian earthquakes was supplied by the Australian Seismological Centre, BMR. The Centre publishes a more detailed monthly list for subscribers and contributors.

Oct 1991- Mar 1992 Earthquakes

1992	ML	Place
<i>Mar</i>		
10	3.2	Uluru NT
<i>Feb</i>		
25	4.4	Tennant Creek NT
<i>Jan</i>		
16	3.3	Tennant Creek NT
17	4.1	Tasman Sea
21	3.0	Meckering WA
23	3.5	Cessnock NSW*
1991		
<i>Dec</i>		
01	3.6	Jimna Qld
13	4.3	Cranbrook WA
<i>Nov</i>		
05	3.8	Salmon Gums WA
18	3.4	Port Hedland WA
20	3.4	Tennant Creek NT
29	3.3	Moralana SA
29	3.5	Moralana SA
<i>Oct</i>		
09	4.0	WA/NT border
14	3.8	Tennant Creek NT
18	4.2	Exmouth WA
02	3.7	Peterborough SA
23	4.0	Marble Bar
24	4.3	St. George Qld

* coal mining headwall collapse

Courses & Conferences

• Stability of Slopes in Seismic Zones. French & Italian Associations for Earthquake Engineering, 14-15 May 1992, Bordighera, Italy.

- **The 10th World Conference on Earthquake Engineering, July 19-25, 1992, Madrid, Spain. Steering Committee, c/o Tilsa, Londres 39-1°B, 28028 Madrid, Spain.**
- 7th Int. Seminar Earthquake Prognostics, Sept 22-26, 1992; Asian Disaster Preparedness Centre, Bangkok, Thailand.
- 3rd International Conference on Case Histories in Geotechnical Engineering, 1-5 June 1993, St Louis, MO, USA.
- 10th International Caly Conference, University of Adelaide, SA, 18-26 July 1993
- The 10th European Earthquake Engineering Conference: 28 August to 2 Sept 1994, Vienna, Austria
- (flyers available from Hon Secretary)

Earthquake publications

- A book on the earthquake history of Newcastle NSW was published last year. Local historian Cynthia Hunter has delved into old newspapers and rare reports to compile the most complete account yet published of earthquakes felt in the Hunter region since European settlement. The book should be of great interest to town planners, engineers, architects and hazard researchers alike as well as the general public. It is a well written, and fascinating account of the early development of Australia and so of interest to the general reader. The book *EARTHQUAKE TREMORS FELT IN THE HUNTER VALLEY SINCE WHITE SETTLEMENT* can be purchased for \$18.50 (\$1.50 postage) from Hunter House Publications, PO Box 536, Raymond Terrace 2324.
- The IEAust Newcastle Earthquake Study is still available at EA Books, PO Box 588, Crows Nest NSW 2065 at the reduced price of \$30.
- There are a number of BMR Bulletins and reports describing earthquake activity in Australia which can be purchased from BMR. The Iseismic Atlas, parts 1 & 2, (Bulletins 214 & 222) contain maps and descriptions of 149 felt and damaging earthquakes. A third edition with another 80 odd maps is being prepared. The Australian Seismological Centre also publishes an annual report featuring the year's seismicity with summary, glossary and descriptions of the larger earthquakes. Reprints of papers on the Newcastle and other important earthquakes may still be available from the authors. A monthly summary of Australian and worldwide activity is distributed at cost to subscribers.



The photograph depicts an apartment building which toppled during the 1964 Niigata Japan earthquake, magnitude Ms 7.5 (note the neighbouring building in the top right-hand corner of the photo). Occupants can be seen walking down the side of the flats with their belongings. Liquefaction and inadequate building foundations contributed to the failure. The building sustained no cracks and strong motion records nearby recorded a sudden reduction in the high frequency shaking at the onset of liquefaction.

Earthquakes > 7.9, 1904-1989

