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AEES is a Technical Society of
IEAust The Institution of Engineers
Australia and is affiliated with IAEE

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AEES Newsletter

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President's Column

Members may have noted in the June issue of *Engineers Australia* that the technical societies of the Institution were listed. We are but one of 31! Of interest to me were the aims for the various technical societies. The aims for our society, as originally identified when society was established are: "AEES promotes the practice of earthquake engineering and engineering seismology. Its activities include technical conferences, publications and acting as the Australian representative in dealings with the International Association of Earthquake Engineering and other earthquake engineering groups." Are these still suitable? Given the feedback at the 2001 AGM, I suspect that the society may want to revisit them. A number of other related issues that our society might look at is our relationship with the profession, our sister organizations in New Zealand and beyond, and our role in regards to Australian Standards. Indeed, this year's technical seminar will hopefully help in answering some if not all of these questions. Members should feel free to contact their national committee or state representatives to raise matters they want discussed by the society.

To change the subject, our Editor (thanks Kevin!) has suggested that members may be interested in some of the earthquake related research work that I've observed underway in Italy recently. Some of the work is focused on the effects of big earthquakes, some is also highly relevant for us here in Australia. For example, a large EU funded project was conducted looking at the seismic resistance of reinforced concrete frames with and without unreinforced masonry infill panels. This project involved extensive numerical modeling to examine the likely behaviour of such buildings under progressively increasing earthquake magnitude. The project culminated in pseudo-dynamic testing of two full-scale four-storey, 3-bay concrete frames (refer

fig.1). Both frames featured construction details typical of construction in the 1950s – that is, round (not deformed) reinforcement, 300 mm spacing of and 90 degree bends in ligatures, insufficient lap splice development lengths and poor beam-column joint details. The bare RC test frame "failed" during the 1000-year Eurocode design earthquake by lap-splice/shear failure in the 2nd storey where there was a decrease in column strength. The test was stopped and then several difference seismic retrofit schemes were evaluated in subsequent tests of the damaged frame. Schemes tested were (a) application of external steel straps around the top and bottom of each column, (b) increasing the cross-section of the columns with additional reinforced concrete, and (c) installation of damped bracing. The 2nd frame had unreinforced brick masonry installed in the frame prior to testing. This frame successfully survived the 1000-year earthquake but failed very early on in the 2000-year event. The failure mode was much different than for the bare frame, with failure occurring at the ground floor in the masonry infill combined with severe cracking in the beam column joints (refer Fig.2). The storey drift profiles for each test frame are shown in Figure 3.

At the University of Pavia, just south of Milan, work is underway to develop a rational displacement-based method for assessing the seismic strength of historical masonry buildings. The researchers there have been very interested in the work done at Melbourne and Adelaide Universities for the out-of-plane bending failure mechanism. I have been collaborating with Professor Magenes to adapt our method for use with old historical Italian masonry. We have also applied for research funding to further this work to account for the in-plane failure mechanisms too.

Finally, much work has been conducted over the last decade into the seismic upgrading of bridges. Initial emphasis was placed on the use of conventional reinforced concrete enhancement or steel jacketing. However, the use of fibre composite jackets has been the main focus more recently.

Of course, this is only a taste of the earthquake engineering research underway in Italy. It seems that with the benefit of EU funding, over the past decade there was a rapid surge in the numbers of Italian earthquake engineering researchers as evidenced by the large number of attendees at the last World Earthquake Engineering Conference held in Auckland in 2000.

Finally, I should note that preparations are well in hand for our annual technical meeting. As noted in the earlier newsletter, this year's theme is "*Total Risk Management in the privatized (de-engineered public sector) era*". In keeping with this focus and sentiments from last year's AGM, we will have

keynote speakers from Emergency Management Australia and the State Emergency Services, as well as many interesting talks from representatives of the media, insurance, fire/police and local government sectors. Combined with seismological and engineering papers, it promises to be an informative two days.



Fig. 1 – Test frames prior to testing at Joint Research Centre, Ispra, Italy



Fig.2 – Ground floor damage during 2000 year earthquake test (stopped).

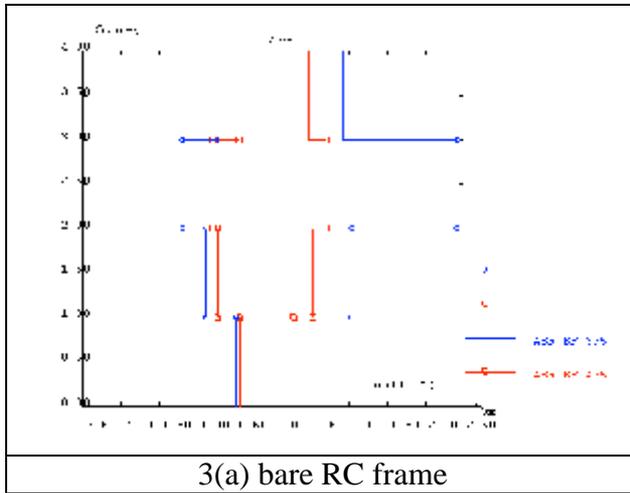
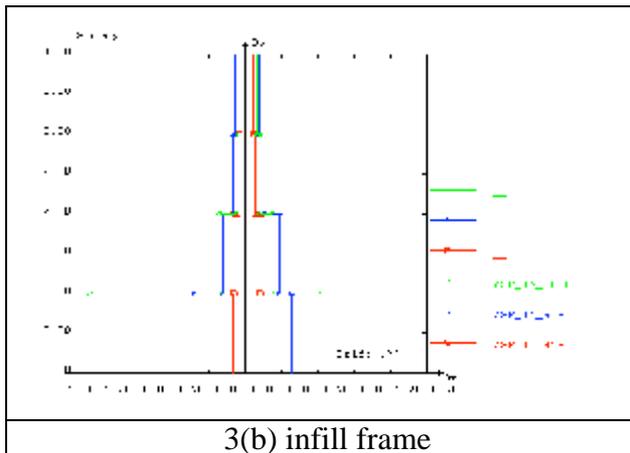


Fig. 3 – Storey drift profiles for 4-storey RC frames



3(b) infill frame

I look forward to seeing many of you in Adelaide at that time (17-18 October).

Mike Griffith

The Society's Executive

President - Prof Mike Griffith (Adelaide Uni)
Secretary - David Love (PIRSA)
Treasurer - Peter McBean (Wallbridge and Gilbert)

The state representatives are:

NSW Michael Neville
 Qld Russell Cuthbertson
 Vic John Wilson
 Tas Vagn Jensen
 ACT Gerhard Horoschun
 SA Jim Wilson
 WA Peter Gregson

- IAEE National Delegate to 2004 is John Wilson (The University of Melbourne).
- The AEES Webmaster is Vaughan Wesson (SRC)
- Barbara continues to manage the Secretariat from The University of Melbourne.

The Society website/email list

Dear AEES Members,

The AEES web site is at www.aees.org.au. Any contribution from you on the following topics is most welcome

- details of interesting recent publications
- significant research projects in earthquake engineering (in Australia?)
- links to other relevant Web sites

Please send me your contributions/suggestions via email.

The AEES email list is operated by the Seismology Research Centre, Melbourne. If you would like to register please notify me at vaughan@seis.com.au

Vaughan Wesson

Earthquakes in Australia ML ! 2

May - August 2002

The sequence at Burakin WA continued through to August though at a diminishing rate. The largest earthquake in the period was the ML 4.4 event in central Tasmania on 15 June that was widely felt and well reported by the media. It caused no damage. We have included many of the small events recorded by Geoscience Australia, SRC and PIRSA to illustrate just how many events occur in the Australian region. There were events in or close to all states and territories.

Many of these smaller events are felt and worry local residents, some of them even cause minor non-structural damage when the epicentre is very close to an old non-engineered building.

Da te	UTC Time	Lat °S	Long °E	M	Place
May 2002					
02	40514.48	17.74	119.60	3.4	Rowley Shoals WA
02	214838.3	25.56	151.11	3.0	Felt by many residents of Eidsvold Qld.
03	210718.8	32.59	116.89	1.6	Pingelly WA.
04	13722.48	32.07	117.74	2.7	Corrigin WA.
04	161143.6	33.52	138.32	1.9	Clare area SA.
04	184737.0	31.69	138.78	2.9	NE Hawker SA*
04	223831.1	38.71	145.75	2.8	C Paterson Vic. felt in Inverloch
05	94050.59	28.75	116.03	1.8	Morowa WA
05	95258.92	34.03	117.82	1.5	Gnowangerup WA
06	25440.85	19.87	133.94	2.6	Tennant Ck NT
07	224447.9	28.60	149.40	2.4	Goondiwindi Qld
07	225827.8	30.54	117.04	2.0	Burakin WA.
08	111823.7	30.50	117.05	3.2	Burakin WA.
09	164720.5	30.55	117.03	2.1	Burakin WA
10	114253.4	33.51	135.88	2.7	Near Loch SA*
10	204900.4	33.95	134.79	2.5	Cap Island SA.
11	132611.8	35.91	148.93	2.3	Adaminaby NSW
11	135034.9	25.02	113.19	2.9	Indian Ocean WA
11	142950.6	28.85	116.34	2.0	Barnong WA
11	145030.5	28.67	116.29	2.3	Barnong WA
11	194349.9	36.31	148.93	1.8	Berridale NSW
16	111648.3	30.54	117.04	2.6	Burakin WA.
17	4101.33	33.05	138.76	2.0	Peterborough*SA
17	165523.6	30.63	118.03	2.1	Near Beacon WA
17	231728.9	35.27	148.32	1.6	Tumut NSW.
19	173502.9	30.54	117.04	1.5	Burakin WA.
21	85735.87	30.57	117.04	1.6	Burakin WA.
23	33945.05	30.84	116.70	1.5	Burakin WA.
23	130103.8	37.97	146.40	2.0	Erica Vic.

24	25136.21	31.37	117.68	1.5	Kellerberrin WA
25	140834.7	30.54	117.06	2.8	Burakin WA.
26	44849.12	30.55	117.08	2.7	Burakin WA.
26	112614.4	30.56	117.05	1.6	Burakin WA.
27	55136.8	30.54	117.04	2.5	Burakin WA.
28	2639.76	30.53	117.06	2.2	Burakin WA.
28	83247.09	30.53	117.06	2.3	Burakin WA.
28	213201.0	33.02	138.8	1.5	Peterborough*SA
29	185729.2	33.05	138.75	1.6	Peterborough*SA
29	195437.8	30.57	117.03	2.3	Burakin WA.
30	171027.3	30.58	117.04	3.1	Burakin WA
31	2237.95	30.55	117.03	1.6	Burakin WA.
31	43645.45	35.09	149.03	1.9	Murrumbateman NSW.
31	131600.9	30.55	117.05	2.4	Burakin WA.
June					
01	100001.9	33.03	138.77	1.7	Peterborough SA
02	1254.41	34.64	148.18	2.9	Cootamundra NSW*
02	35514.2	35.17	149.49	2.6	BungendoreNSW
04	175858.7	35.99	150.94	3.0	Tasman Sea.
11	95332.2	33.35	119.08	2.2	Newdegate WA.
11	200507.4	30.53	117.03	2.0	Burakin WA.
11	200758.8	32.37	117.12	1.7	Brookton WA.
12	24414.8	32.37	117.11	2.4	Brookton WA*
12	33139.8	32.39	117.10	2.7	Brookton WA*
12	42335.54	32.38	117.12	2.4	Brookton WA.
12	45338.55	32.38	117.12	1.8	Brookton WA.
12	50449.27	32.42	117.14	1.5	Brookton WA.
12	52609.84	32.42	117.14	1.6	Brookton WA.
12	52925.02	32.42	117.13	1.5	Brookton WA.
12	191413.2	32.40	117.09	2.5	Brookton WA.
13	20744.29	32.43	117.12	2.6	Brookton WA.
13	65846.2	33.65	139.96	2.3	Near Burra SA.
13	184618.7	19.46	113.97	4.4	Indian Ocean.
13	203602.7	20.19	113.37	4.2	Indian Ocean.
14	134837.7	32.39	117.12	2.5	Brookton WA.
15	211842.6	42.12	147.43	4.3	L Sorell Tas. Felt widely.
16	25901.55	30.49	117.04	3.3	Burakin WA.
17	103908.7	30.50	117.05	2.5	Burakin WA.
17	104120.2	30.51	117.04	2.6	Burakin WA.
17	104423.4	30.48	116.99	2.0	Burakin WA.
17	172519.3	30.52	117.04	3.4	Burakin WA. *
19	23823.39	30.52	117.02	2.0	Burakin WA.
20	35432.79	30.53	117.09	3.6	Burakin WA.*
20	52146.2	30.53	117.10	2.7	Burakin WA.
20	122053	34.39	148.71	2.9	Boorowa NSW*
21	232931.3	30.50	117.1	2.6	Burakin WA
22	180334.3	30.51	117.10	2.4	Burakin WA.
22	182213.3	30.55	117.06	2.2	Burakin WA.
23	85552.73	30.54	117.05	2.4	Burakin WA.
23	103251.6	30.55	117.05	2.5	Burakin WA.
23	112113.2	30.55	117.12	3.8	Burakin WA. *.
24	14637.49	30.56	117.02	1.6	Burakin WA.
24	21513.96	30.54	117.05	2.5	Burakin WA.
24	24844.27	30.51	117.06	1.8	Burakin WA.
26	55111	30.46	116.97	2.0	Burakin WA.
26	204209.3	30.53	117.03	1.9	Burakin WA.
27	112537.4	30.49	116.92	1.8	Burakin WA.
28	125720.7	23.29	130.09	3.2	Sandy Blight Junction NT
29	180512.4	30.57	117.04	2.5	Burakin WA
30	52655.49	30.49	117.06	3.0	Burakin WA.
July					
02	31914.89	31.82	151.39	2	Ellerston NSW.
03	33058.6	30.55	117.07	2.1	Burakin WA.
03	40533.5	30.56	117.07	1.7	Burakin WA.
03	150940.5	34.41	138.90	2.3	SW Kapunda SA
04	12642.61	30.52	117.06	2.3	Burakin WA.
04	41008.59	31.59	138.73	2.3	Felt at Willow Springs SA
04	73314.42	30.56	117.10	2.3	Burakin WA.
04	75343.99	30.59	117.04	1.8	Burakin WA.
04	101449.0	30.77	118.17	2.2	Mukinbudin WA
05	3118.27	30.55	117.03	2.7	Burakin WA.
07	101339.1	30.53	117.04	1.8	Burakin WA.
09	235.24	30.56	117.05	2.4	Burakin WA
09	234605.4	30.52	117.06	2.9	Burakin WA.
10	21858.5	30.53	117.05	2.7	Burakin WA.
10	33926.83	32.60	117.84	2.2	Corrigin WA.
11	222645.6	30.53	117.07	2.1	Burakin WA.
13	213255.2	36.37	148.70	1.5	Jindabyne NSW.
14	50159.76	30.52	117.06	1.8	Burakin WA.
14	84755.08	30.56	117.05	1.7	Burakin WA.
15	5832.63	30.55	117.02	2.0	Burakin WA.
15	65951.21	30.56	117.07	1.8	Burakin WA.
15	102926.4	30.64	121.55	2.1	Kanowna WA.
15	185044.2	36.37	148.68	2.1	Jindabyne NSW.
15	185550.4	36.37	148.69	1.8	Jindabyne NSW.
15	205316.4	36.36	148.71	1.7	Jindabyne NSW.
19	54012.75	39.26	144.80	2.9	Bass Strait Vic.
20	654.62	33.07	138.42	2.1	40 km west of Peterborough SA
21	55658.1	34.14	147.91	2.0	Grenfell NSW.
22	60142.77	35.74	147.05	1.7	Culcairn NSW.
22	143845.8	40.92	148.07	3.2	Gladstone Tas. Felt widely in NE Tasmania
22	193838.8	30.56	117.07	3.4	Burakin WA
23	120539.0	22.1	126.30	2.5	Gibson Desert WA
23	141710.8	33.53	138.54	2.1	Clare SA.
23	160930.2	30.52	117.07	3.2	Burakin WA*
23	183855.4	31.63	145.59	2.7	Near Cobar NSW
24	204802.9	30.38	121.24	3.2	46 km NW of Kalgoorlie WA*
25	14941.12	30.56	117.06	1.9	Burakin WA.
25	20639.08	30.56	117.06	2.5	Burakin WA.
26	73124.41	30.58	117.06	2.2	Burakin WA
27	190842.5	30.55	117.07	2.9	Burakin
27	202102.8	33.87	148.28	2.0	Grenfell
28	32702.33	30.57	117.06	2.0	Burakin WA.
28	53324.67	30.56	117.06	1.5	Burakin WA.
28	175339.7	30.55	117.06	1.8	Burakin WA.
29	123820.3	36.36	148.78	1.9	Berridale NSW. Felt at Kalkite
30	52127.66	30.55	117.08	2.4	Burakin WA.
30	64326.49	36.35	148.71	2.7	Jindabyne NSW.
31	235840.1	31.86	138.75	2.9	Hawker area SA.
August					
01	606.85	30.56	117.06	1.6	Burakin WA.
01	185815.4	32.30	138.69	3.3	Carrieton SA.
01	204858.6	33.65	147.63	2.2	Forbes NSW
02	104114.1	30.56	117.06	2.5	Burakin WA.
02	134331.8	30.92	121.21	3.8	Coolgardie WA. Felt in Coolgardie and Kalgoorlie. (possible mine rockburst).
03	111343.2	33.39	138.33	2.6	Spalding SA
05	115133.2	29.14	125.12	2.2	Great Victoria Desert WA.
05	183610.4	30.58	117.04	1.5	Burakin WA.

05	201627.3	30.58	117.05	1.9	Burakin WA.
06	54954.95	30.56	117.08	3.2	Burakin WA.
06	220152.5	30.53	117.04	1.6	Burakin WA.

* felt

The AEES subscription year is the fiscal year. It is expensive to send each member an individual reminder that fees are due so please help us by sending your subscription for 2001/2002 to AEES if you haven't already done so (attn: Barbara Butler, Civil and Environmental Engineering Dept, Melbourne University Parkville Vic 3052) or renew through IEAust's annual subscription system by marking AEES your preferred Society. If you change address or if you know a member who is not receiving the newsletter please advise the Secretary or Barbara.

News

CRC for Construction Innovation

The Brisbane-based Cooperative Research Centre for Construction Innovation (CRC CI) has been officially launched. The new CRC is a collaboration between nineteen industry, government and research partners across Australia.

The CRC CI has been made possible through a \$14 million federal government grant and \$50 million in industry, research and other government funding.

Research committee chair John Oliver said it is the most significant commitment ever made to construction research in Australia.

(from IEAust enews)

Large earthquake in Argentina

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY NO. 2-155
NEIC QUICK EPICENTER DETERMINATIONS
MAY 28

UTC TIME LAT LONG DEP mb Ms
040421.8 28.938S 66.571W 23D 6.1 5.7
CATAMARCA PROVINCE, ARGENTINA. MW 6.0 (HRV), 5.9 (GS). At least 27 people treated for injuries, forty to sixty houses collapsed and about fifty percent of the houses sustained some damage in the areas of Aminga, Anillaco and Aqua Blanca. Felt strongly in the Catamarca, La Rija, Santiago del Estero and Tucuman areas.

(Ed This is an intraplate earthquake, like those in Australia).

New Earthquake Engineering Society

Coincidentally Argentina has just established a national Earthquake Engineering Society. Good timing!

08	170234.8	34.99	148.69	2.0	Burrinjuck NSW
09	165031.1	36.37	145.15	2.5	Tatura Vic.
10	120829.3	33.80	148.77	2.7	Cowra NSW.

Changes to the Building Code of Australia and Revision of the Loading Standards As1170 Series.

Dr Lam Pham, Chief Research Scientist, CSIRO Building Construction and Engineering / ABCB Senior Manager provided the following abstract for a talk he gave in Canberra to IEAust members and guests on Tuesday 13 August.

The Building Code of Australia (BCA) is a uniform set of technical provisions for the design and construction of buildings and other structures throughout Australia. It is produced and maintained by the Australian Building Codes Board (ABCB) on behalf of the Commonwealth Government and all State and Territory Governments.

The Loading Standards (AS1170 Series) are referenced in the BCA as a means of compliance with the requirements of the BCA. They are key documents required for structural design.

There have been some changes in the policy of the ABCB concerning the BCA Referenced Standards. The Loading Standards are the first to be affected by these changes.

This presentation outlines recent changes in ABCB policy and their effect on the current revision of the Loading Standards. There will be a need for structural engineers to refer to the BCA in their day-to-day work. A brief review of the major changes to the Loading Standards is also presented.

Earthquake Prediction in South Australia

Now we can confess. Seismologists in Australia were alerted early last year of an impending earthquake in the mid-north of South Australia. Professor Peter Mora announced the prediction at a scientific meeting in Canberra but warned the audience against alerting the media to prevent a panic. A joint team from the China Seismological Bureau and Queensland University used the accelerating moment release and LURR methods to predict a moderate to large earthquake in the mid-north of SA with a generous 12 month time window closing in mid-2002.

The mid-north is a relatively active area of South Australia so there was definitely a chance of such an earthquake occurring anyway. But it didn't.

Emergency services were duly advised but, like their French counterparts when warned of an impending eruption under Paris, could only revise their response rather than debate the science.

Earthquake source studies are in their infancy and little is known about what triggers or stops an earthquake. Prediction efforts should be applauded and financed, particularly the study of the source dynamics.

Fortunately this prediction was not broadcast. It is good to see that pattern studies are progressing and we should accept that false alarms are just milestones along the rocky paths to better models.

Professional Indemnity Insurance – are you getting any?

If you are in my position you are not. It is virtually impossible to get PI insurance in Australia at the moment, especially it seems if you are in the risk/hazard assessment business. But isn't that the business the insurance industry is/was in? So what's wrong?

The cover story in IEAust's magazine Engineers Australia of July 2002 (Vol 74 No 7) is titled *Short-term outlook for professional indemnity insurance is bleak*. It seems Dr Peter Miller has been predicting this crisis for many years. This is due to the increasing propensity for litigation, a decrease in insurance business profitability nationally and internationally and lack of tort law reform in Australia. It seems that the insurance industry has been relying on profits from investments rather than underwriting to produce income.

A paper by the Association of Consulting Engineers Australia says that claims are often made on the perceived capacity to pay rather than the perceived responsibility for damage. This is apparently what happened in a case following the 1989 Newcastle earthquake, the Newcastle City Council was seen to have the deepest pockets.

The Engineers Australia article shows a remarkable graph of global insurance losses vs time. The trend is not only for higher mean losses over the last two decades but a rapidly escalating variance in losses per year.

In Australia the Newcastle earthquake of 1989 and the Sydney hailstorm a decade later caused record insurance payments.

Peter Miller pointed out that events such as acts of war, riot and civil commotion were previously uninsurable but the WTC collapse absorbed about a third of the total international reinsurance pool. Earthquakes too were once considered by insurance companies to be acts of god but are now covered in your fire policy at no extra premium cost.

Miller says that we *need to be less* risk averse at a time when we are demonstrating that we *want to be more* risk averse.

Kevin McCue

ps IEAust is welcoming feedback about the difficulties being experienced getting PI insurance. Contact Ann Ryle at aryle@ieaust.org.au

FORTHCOMING CONFERENCES

21 - 25 July 2002 7th US National Conference on Earthquake Engineering, Boston USA.

15 – 20 August 2002 The International Conference on advances and new challenges in Earthquake Engineering Research, Harbin and Hong Kong, China. Information at <http://mceer.buffalo.edu>

9 - 13 September 2002 The 12th European Conference on Earthquake Engineering, Barbican Centre London.

16 - 19 September 2002 3rd International Conference on Continental Earthquakes. www.icce.ac.cn

3 – 6 Oct 2002 Hazards 2002 Symposium, 9th International Symposium on Natural and Human-made Hazards. Disaster Mitigation in the Perspective of the New Millennium, Antalya, Turkey

We would like to inform you that HAZARDS 2002 is about geological, meteorological, hydrological, marine, and human-made hazards. Contacts at:

<http://www.hazards2002.metu.edu.tr>

13 - 15 February 2003 PCEE Pacific Conference on Earthquake Engineering. Christchurch New Zealand. (closing date for abstracts was April 2002).

www.nzsee.co.nz/pcee

12 - 14 May 2003 SEE4, 4th International Conference on Seismology and Earthquake Engineering. Tehran.

www.iiees.ac.ir

22 - 26 June 2003 Soil-Rock2003, MIT, 12th Panamerican Conference on Soil Mechanics and Geotechnical Engineering, and 39th US Rock Mechanics Symposium.

NEW BOOKS (& OLD) / REPORTS

Australian Seismological Report - 1998 Record 2002/1
Geoscience Australia Sales Centre
ph: 02 6249 9519, fax: 02 6249 9982

A REMINDER

**THE AEES ANNUAL CONFERENCE WILL BE HELD AT THE UNIVERSITY OF
ADELAIDE
OCTOBER 17-18, 2002**

Total Risk Management in the Privatised Era

AN INVITATION

The Conference Organising Committee warmly invites you to attend the 2002 Australian Earthquake Engineering Conference at Adelaide University. The conference programme is exciting with two excellent keynote speakers and over 40 presentations from individuals across Australia. Session themes will cover such as Total Risk Management, Emergency Management, Seismology, Seismic Upgrades of the Built Infrastructure, Role of Insurance in Earthquake Preparedness and Recovery, Media Management. The committee looks forward to welcoming you to what promises to be a rewarding, stimulating and enjoyable conference.

KEYNOTE SPEAKERS

Bruce Esplin - Bruce was appointed as Victoria's first Emergency Services Commissioner in June 2000. It is a unique role in Australia and was created to develop a more strategic approach to emergency services resource planning across the state. One of Bruce's key roles is to establish and monitor performance standards across the fire and emergency services, while also having a central role in the "whole-of-government" coordination of emergency situations in Victoria. Bruce has a strong interest in change, particularly in the public safety area, and is committed to ensuring that Victoria's emergency management arrangements are able to effectively manage the increasingly complex situations confronting governments around the world.

Jonathon Abrahams is Acting Director Development Group, Emergency Management Australia. This group has responsibility for the EMA Projects Program, Australian Safer Communities Awards and developing National and Commonwealth strategies, with a focus on disaster prevention and mitigation, land use planning for natural hazards, disaster loss assessment, raising the profile of emergency management and enhancing local government emergency management capability. Jonathon has previously chaired the National Mitigation Working Party, and represents the Commonwealth on the Productivity Commission's Emergency Management Performance Measurement Working Group. He holds a Master's Degree in Public Health.

Other speakers will include:

Bruce Bolt - Professor Emeritus, Civil and Environmental Engineering, University of California, Berkeley author of many books on seismology.

David Brunson - Eminent engineer and immediate Past President, NZSEE, involved in the seismic risk evaluation of critical infrastructure.

Day 1 will conclude with the Annual General Meeting, followed by the Conference Dinner at Ayer's House Restaurant. The food, wine and entertainment during the dinner promise a relaxing and enjoyable evening, and your guests will be most welcome to join us. Ayer's House is at 288 North Terrace. The dinner is inclusive in full registration fee. Day registrants and guests pay \$75.00 each.

Full registration fees and student fees cover attendance at all sessions Thursday 17 October and Friday 18 October, morning and afternoon teas, lunches, one set of proceedings and attendance at the Conference Dinner on Thursday evening.

Day registration fees cover attendance at all sessions on one selected day - Thursday 17 October or Friday 18 October, morning and afternoon tea and lunch, one set of proceedings and conference satchel. Attendance at the Conference Dinner is an additional cost.

Pre-conference Workshop - Towards an Australian Seismicity Model
Tuesday 15 October. This one day workshop is fully sponsored by Geoscience Australia.
Contact workshop convenor mark.leonard@ga.gov.au or telephone (02)6249 9357.

For further information or registration brochure, please contact:

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