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

2/2000

AEES Newsletter

Contents

President's Perambulations	1
AEES 2000 Conference & AGM	1
The Society Website/email list	2
Nuggets from the Newsgroup	2
Earthquakes in Australia, 1999	3
Recent strong motion recordings	3
Letter to Editor	5
Obituary -Dr Malcolm Somerville	5
Forthcoming Conferences.....	7
Report: 12 th WCEE	7
New Books and old	7
Earthquake Engineering Research Scholarship ..	8

PRESIDENT'S PERAMBULATIONS

Along with about 2,000 other delegates, including 30 or so from Australia, I attended the 12th World Conference on Earthquake Engineering in Auckland from 30 January – 4 February, 2000. The conference was very well organised and the offerings ranged over key-note speakers giving state-of-the-art addresses on topics of interest, theme sessions with speakers, poster sessions, plenary sessions on the Turkey and Taiwan earthquakes, a public debate on our effectiveness in reducing earthquake risk and several social events. By any standard the conference would have to be rated as an outstanding success and the organisers are to be congratulated.

I represented the Society at two recent meetings in Melbourne.

The Society Consultative Committee of the Institution of Engineers, Australia met on 15 March. The Committee comprises the chairman of each society, and College chairmen and national office staff also attended. There are 32 societies with a total membership of about 10,000. The main topic of discussion was the proposed new structure and organisational arrangements for the Institution and the role of societies (and other groups) in the new structure. There was an emphasis placed on societies playing a more prominent role in continuing professional development. A brief article on the proposed arrangements appeared in the March issue of Engineers Australia.

The committee preparing the new AS/NZS earthquake loading standard met on 20 and 21 March to consider the draft document produced under contract and based on the decisions reached in Wellington last year. More than 300 comments from working group

and committee members were considered and decisions taken on the content of the next draft.

Elsewhere in this newsletter you are invited to apply for a research scholarship or register for post-earthquake activities. These invitations derive from our AGM in Sydney last year.

Bill Boyce

AEES 2000 Conference and AGM

The conference theme:

[Dams, Fault Scarps and Earthquakes.](#)

The theme is broad enough to be of interest to engineers, geologists, seismologists, emergency managers and planners.

Venue:

The main lecture theatre at the Geology Department, University of Tasmania in Hobart.

Date:

Wednesday 15 to Friday 17 November 2000

Conference dinner:

Mures upstairs (subject to availability), Wednesday night immediately following the AGM.

Excursion:

On the Friday there will be an excursion to the Lake Edgar Fault Scarp, the Gordon Dam and possibly a visit to the Gordon power station with lunch at the Strathgordon Chalet. It will mean an early start and long day but should be most interesting, especially to those who have never visited the area. Participants will have to bring wet weather gear if they want to walk down to the scarp through the button grass since no guarantee can be given on the sort of weather we might experience at this time of the year. There is a lot of interesting geology to be seen in the area.

Call for papers: Please send papers to Barbara Butler by 30 July 2000 so that referees can be advised for pre-conference publication.

Vagn

The Society

President - Bill Boyce (Kinhill, Qld)
Secretary - Russell Cuthbertson (Qld Uni)
Treasurer - Colin Lynam (Qld Uni)

The state representatives are:

NSW	Michael Neville	Qld	Gary Huftile
Vic	John Wilson	Tas	Vagn Jensen
ACT	Kevin McCue	SA	Mike Griffith
WA	Peter Gregson		

IAEE National Delegate is John Wilson (UniMelb).
The AEES Webmaster is Vaughan Wesson (SRC).
Barbara Butler manages the Secretariat from Melbourne University.

The Society website/email list

Dear AEES Members,

The AEES web site is at www.aees.org.au. We will again use an online form for registrations for the November AEES conference in Hobart and are always looking for suggestions on other things to be included besides copies of the newsletter and details about relevant upcoming conferences:

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

Please send contributions/suggestions via email to "vaughan@seis.com.au"

Cheers, Vaughan Wesson

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

AEES REGISTER OF POST-EARTHQUAKE ENGINEERS

At the 1998 AGM in Perth, the Society resolved to establish, on a state basis, registers of people who could be mobilised for post-earthquake activities. This had been discussed previously but to date no action had been taken.

The executive discussed the matter at length during 1999 and raised some concerns, such as:

- privacy considerations;
- the difficulty of maintaining the list;
- our inability to verify competency of persons on the list;
- potential liability issues.

It is interesting to note that the New Zealand Society for Earthquake Engineering has been considering this issue for some years and published a paper in the December 1998 issue of their Bulletin; "Post Earthquake Response: Issues associated with

compiling a register of engineers", by D.R. Brunson & R.B. Shephard.

It was agreed at the 1999 AGM in Sydney that we would publish an invitation for members to express their interest.

If it is likely you would be available to carry out post-earthquake activities after a damaging earthquake in Australia, and if you would wish to appear on a list of such persons which would be forwarded to the relevant State Emergency Services authority, could you please send your details to Mrs Barbara Butler.

Note that this is different from being on a reconnaissance team.

Bill Boyce

Sub-Committee Reports:

Some progress to report at last on activities of two of the AEES committees established at the 1996 Adelaide AGM.

• Revision of the intensity scale

BGR, The German equivalent of AGSO, has recently revised the European Intensity Scale with publication by Dr Gottfried Grunthal of a booklet titled European Macroseismic Scale 1998. A copy has been distributed to committee members Gary Gibson Vic, Peter Gregson WA, Russell Cuthbertson Qld, David Love SA and Kevin McCue ACT for comment. It is proposed that this scale be adopted for use in Australia if applicable and after any modification for local building practice, materials and foundations that are considered necessary.

• Aftershock study

Charles Bubb has commenced a desktop study of world systems for reporting on the likelihood of potentially damaging aftershocks following a damaging mainshock. US practice has been investigated and the literature including the recent WCEE Proceedings searched for relevant material. A report for the AEES Executive is in progress.

NUGGETS FROM THE NEWSGROUP - A REGULAR FEATURE BY CHARLES BUBB

Jai Mahal opined in a recent newsgroup that "apparent contradiction reflects the primitive knowledge of seismogenesis in stable continental region and is at the root of problem of risk assessment of an earthquake"

KOYNA EARTHQUAKE IS NOT A SURPRISE FOR MAHARASHTRA

Koyna - The 12 March 2000 Koyna India earthquake of 5.6 magnitude on the Richter scale should not have been a surprise.

Since the early sixties this region of western Maharashtra - where the famous Koyna dam is situated - has experienced several tremors. Experts suggest this is so as the state is covered by the Deccan traps.

The Maharashtra Disaster Management Plan - after the devastating September 30, 1993 earthquake - has

identified Mumbai, Latur, Beed, Parbhani, Nanded, Nagpur, Nashik, Pune, Satara, Sangli and Ratnagiri as the districts with maximum earthquake risk. Other than the 1993 earthquake which shook Latur with 6.4 Richter magnitude - another devastating quake occurred on December 11, 1967 at Koyna with magnitude of 6.5 on the Richter scale - which claimed several lives and caused immense damage to property.

Latur, from where Maharashtra chief minister Vilasrao Deshmukh hails, claimed over 8000 lives, over 25000 livestock besides damage to property on September 30, 1993.

According to experts and geophysicists, Maharashtra occupies the central-western portion of peninsular India, technically an intraplate continental area. Research reveal that most of the state is covered by the Deccan traps - a sequence of basalt flows formed over 65 million years ago. Though this area was known to be seismically stable, this belief was shattered by the Koyna and Latur earthquakes. This led to review of the seismic history and stability which found as many as 12 districts to be earthquake-prone.

Thus, tectonic stability in the Deccan plateau may appear to be inconsistent with observed level of seismicity - this apparent contradiction reflects the primitive knowledge of seismogenesis in stable continental region and is at the root of problem of risk assessment of an earthquake, according to a paper on risk analysis which was prepared as part of Maharashtra Emergency Earthquake Rehabilitation Programme under the MDMP.

In fact, the Koyna region receives maximum number of tremors in Maharashtra. During the 35 years between 1963 and 1998, the Koyna region has faced 102,715 tremors, of which 79 were above magnitude of 4 Richter and eight were above magnitude 5 Richter. Excluding the Koyna region, the other regions of Killari, Khardi (Bhatsa) and Medhi (Surya), there have been 137 tremors up to 1996 of which 121 tremors were of magnitude 3 Richter or above in Maharashtra and neighbouring areas.

The Jabalpur earthquake of May 23, 1997 which claimed at least 40 lives and injured 1000 others - with its epicentre a bit far away from the Bargi dam of the Sardar Sarovar Narmada project - also reveals that the neighbouring state of Madhya Pradesh is not a stable zone. The adjacent Karnataka state also experienced earthquakes of mild intensity in the past. The Jabalpur earthquake measured 6 on Richter scale, reports UNI (Ed. - not in USGS database).

Peninsula India is, like Australia, intraplate and so the earthquake activity there is of considerable interest to us.

Charles

The AEES subscription year will change in 2001; from calendar to 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 1999/2000 to AEES (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, many newsletters are returned.

Earthquakes in Australia – October to December 1999

This extract is from the AGSO database which includes data from Primary Industries and Resources SA, The Seismology Research Centre Victoria and Universities of Tasmania and Queensland.

The last three months of the 20th century were quiet in Australia, none of the earthquakes caused damage though quite a few of them were felt. Eastern Australia remained very quiet.

DD	UTC	Lat	Long	ML	Place
Oct					
#09	81711.7	-37.759	148.353	3.0	Orbost Vic
10	40002.2	-31.59	110.86	3.3	Indian Ocean
14	194252.6	-38.54	112.25	4.0	Southern Ocean
17	132814.8	-13.9	121.35	3.0	Scotts Reef WA
29	61557	-22.17	113.78	3.2	Learmonth WA
#31	123639.5	-32.407	138.572	3.5	Carrieton SA
Nov					
04	183647.5	-15.97	127.48	3.0	Wyndham WA
#06	145523.5	-32.389	138.595	3.1	Carrieton SA
#09	50522.2	-28.82	121.39	3.6	Leonora WA
#12	7555	-12.079	130.561	3.9	Darwin NT
#15	31627.9	-35.405	137.326	3.3	Investigator Str SA
21	214005.5	-19.839	133.635	3.6	Tennant Ck NT
30	151255.4	-21.24	119.77	3.2	Marble Bar WA
Dec					
01	152554.8	-27.18	126.59	3.2	Vic Desert WA
02	195009.5	-14.82	126.74	4.0	Kalumburu WA
09	192902.7	-20.27	119.48	3.2	Pt Hedland WA
16	123636.1	-16.84	125.88	3.0	Wyndham WA
31	84838.5	-33.18	139.904	3.0	Peterborough SA

earthquake reported felt

CLEARANCE OFFER ON CONFERENCE PROCEEDINGS

Barbara Butler still has copies of our early conference proceedings, more than she can store. We can't sell them quickly so will give them away! Proceedings are yours for the price of postage: fax: 03 8344 4616 or b.butler@eng.unimelb.edu.au

Recent Strong Motion Records obtained in Australia

The Appin NSW earthquake happened on Wednesday, 17th of March 1999 at 12:58pm EDST. The parameters of the earthquake were:

Origin time: 01:58 UTC

Location: 150.739°E, 34.248°S

Depth: 3.2km

Magnitude: $M_L=4.8$ (ASC), 4.4 (SRC)

The earthquake epicentre was about 6 km south of Appin, 6 km east of Wilton and about 60 kilometres southwest of Sydney. It was well recorded on AGSO's and SRC's accelerographs and seismographs at distances between 8 and 200km. The records on the instruments at Wollongong University on rock and soft sediment sites are shown below. The maximum accelerations recorded in Wollongong at about 24 km distance were $3 \times 10^{-3}g$ and $5 \times 10^{-3}g$ respectively.

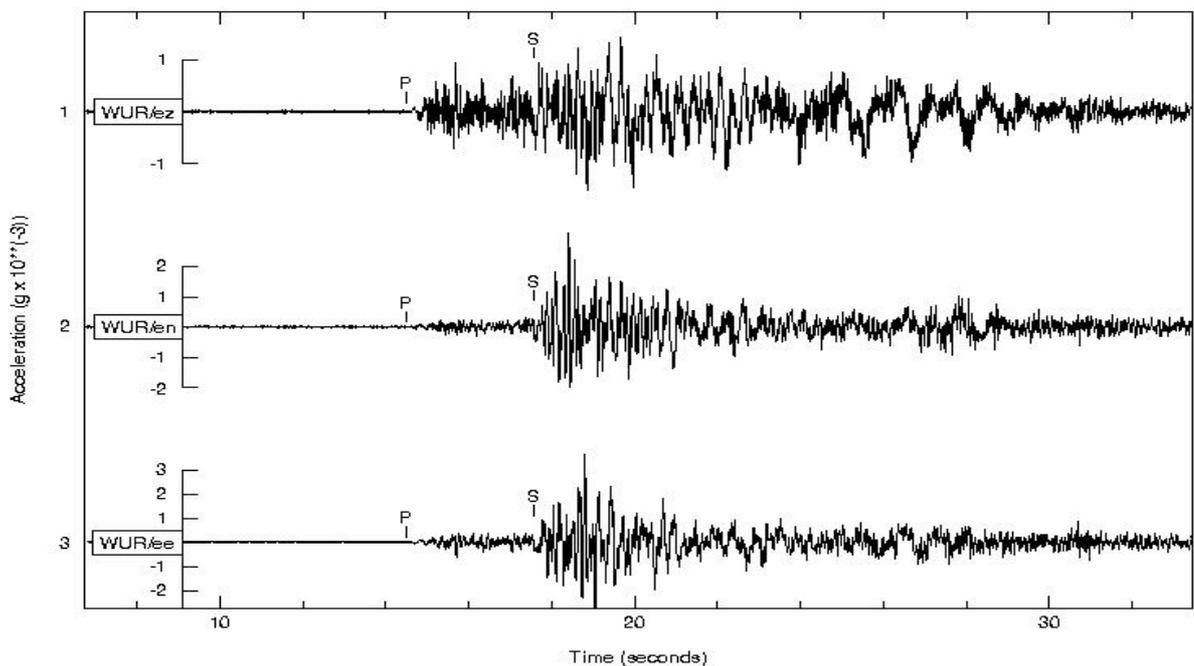
A shallow earthquake of this magnitude could potentially cause some damage to a distance of a few kilometres. The earthquake tripped electrical circuit breakers causing loss of power supply to some 1000 users in the Appin area. The maximum reported

intensity at the epicentre was MMV. Reports of the earthquake being felt were received from the epicentral area, the south-west Sydney suburbs, and a few from north of Sydney. This size earthquake would be felt over a radius of about 100 kilometres (see the isoseismal map on next page).

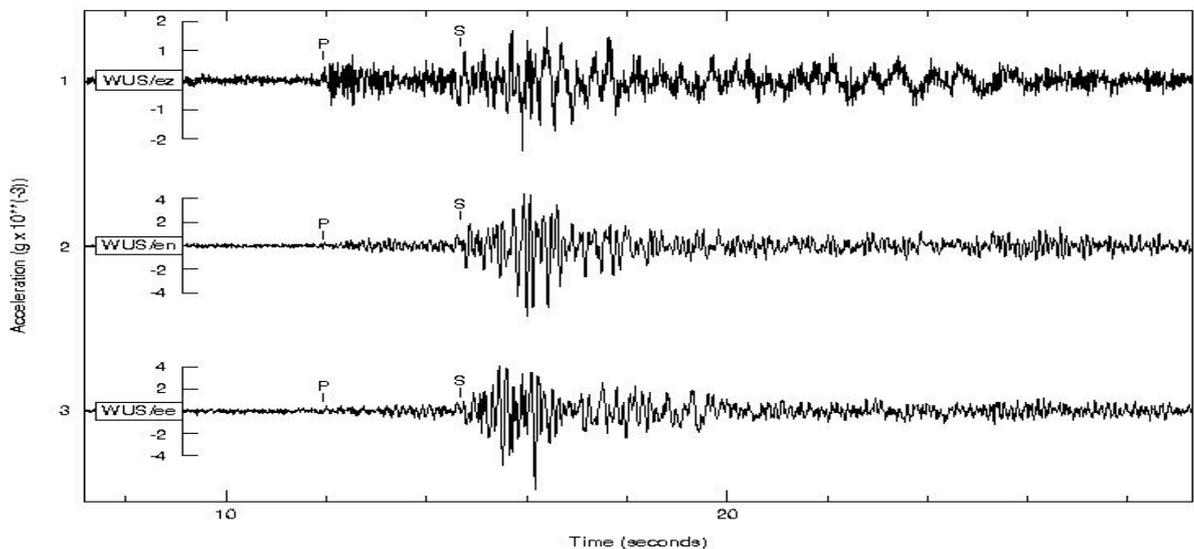
No foreshocks were recorded and there was only one small aftershock about 50 minutes after the main event. There have been four earthquakes greater than magnitude 3 located in the Sydney southwest area over the past 10 years. The last earthquake of similar magnitude, ML 4.8, occurred about 10 km southeast of Appin on 15th of November 1981.

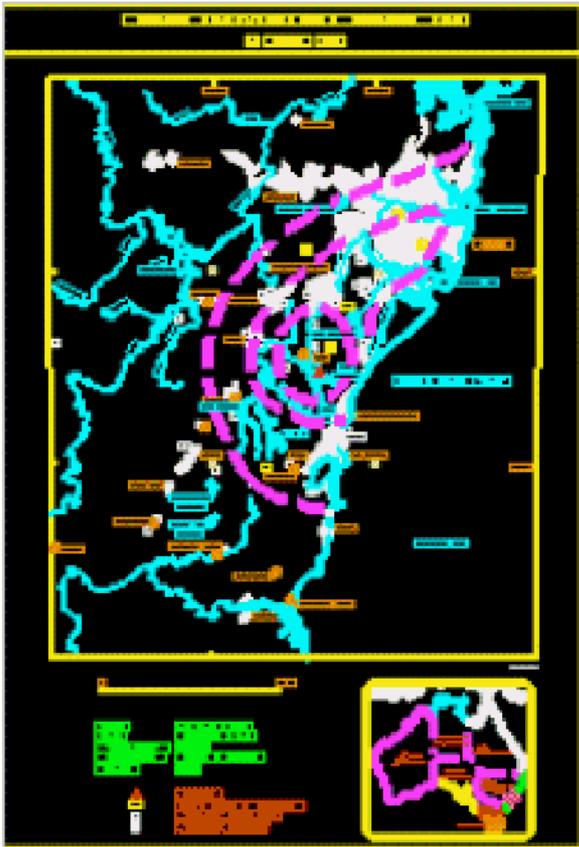
Cvetan Sinadinovski

Wollongong record on rock site of Appin earthquake 01:58UT 17.Mar.1999 MI=4.8



Wollongong record on soft sediments site of Appin earthquake 01:58UT 17.Mar.1999 MI=4.8





Information collected by AGSO and SRC to compile this isoseismal map of the Appin earthquake using the modified Mercalli scale.

Letters to the Editor:

The outstanding success of the Hokudan Symposium and School on Active Faulting in Japan in January this year was achieved by a combination of excellent planning, organization, the generous hospitality of the Hokudan people, and the quality of the exchange of scientific results, opinions, and ideas.

The calm and efficient management by the organizers headed by the Secretary Koji Okumura and Director of the Operation Committee Takashi Nakata, both of the Hiroshima University, resulted in a smooth and flawless meeting. A crucial part was played by the group of devoted students who made sure that all the presentation media operated perfectly. A group of local volunteers helped with whatever was needed and translated from Japanese whenever needed.

The presentations covered all the various aspects of active faulting and hazard analysis, with case studies from all over the world, including spectacular accounts on the recent destructive earthquakes of Turkey and Taiwan.

What made this meeting different and special was the involvement of the local community. The people who suffered from the 1995 earthquake have built a unique museum which preserves the fault rupture and a damaged house. In an effort to commemorate the earthquake and its victims these people take turns telling the museum visitors about their dreadful

experience. We also had an opportunity to listen to people who came to the meeting and gave us a moving account on the 1995 earthquake as well as their lessons from it.

Many participants said that the high standard set by the organizers poses a difficult challenge for future meetings. Perhaps the only way to match or perhaps even surpass the Hokudan 2000 meeting would be a Hokudan 2005 meeting.

Shmulik Marco
Geological Survey, ISRAEL

Takashi Nakata and Koji Okumura, Operational Committee and Daniela Pantosti and Alan Hull, Organizing Committee.

Tax Complaints? The Commonwealth Ombudsman May Be Able To Help

As Government implements the new tax system it is possible that you may have a complaint about the actions or decisions of government agencies. If this occurs you should first try to resolve the problem directly with the agency concerned.

Individuals, businesses, clubs, groups, community organisations, Commonwealth grant recipients, charities and others who are not able to resolve a complaint with a Government agency, are able to raise the matter with the Special Tax Adviser to the Commonwealth Ombudsman.

The Ombudsman's Office has wide powers to conduct an independent investigation of complaints about Commonwealth Government agencies. The Office has statutory independence and a history of rigorous review. It may recommend that the agency provides a solution or remedy to your problem.

You can contact the Ombudsman's office for advice or assistance by;

- Calling the National Complaints Line on 1 300 362 072 (cost of a local call);
- Writing to GPO Box 442, Canberra ACT 2601;
- Accessing the Internet site at www.comb.gov.au or
- Visiting your nearest Commonwealth Ombudsman's Office (located in all capital cities).

Col Lynam

IEAust have a comprehensive information database (for mainly Australian articles and publications) at: <http://www.ieaust.org.au/engine/about.htm>

Would be very useful for any Australian engineer

Regards
Russ Cuthbertson

Obituary

We have tragically lost one of our wiser members. Dr Malcolm Somerville died in a house fire near Adelaide late last year and is sorely missed by his family, friends and colleagues in Australia and overseas. Softly spoken and with a wry sense of humour he would probably, as his brother Paul commented, have found something ironic about the date of his death; the ninth day of the ninth month of the ninety ninth year.

It is true to say that his work at AGSO will live on and affect many of us directly or indirectly; the response spectrum he devised for the Australian side of the joint new Loading Code was recently adopted by the code committee. His model of bathymetric focussing will one day be accepted as the cause of the unusually large Sissano tsunami on the north coast of Papua New Guinea in 1998. The focus of his work at AGSO, the strong motion program is continuing. The research and many consultancies he completed are a model for the next generation of engineering seismologists to learn from.

Malcolm graduated from the University of New England in Armidale where he grew up. He accepted a Fullbright scholarship to do his PhD at the University of California, Berkeley and subsequently spent much of his career in the US. He went on to work at CalTech and then with John A Blume and Associates as Chief Seismologist for several years, probably the most exciting years of his career. He worked on several major projects including the proposed high-level radioactive waste repository site at Yucca Mountain, Nevada and induced seismicity in the oil fields of Colombia. Always willing to share his knowledge, he very much enjoyed a stint in Fiji at the University of the South Pacific lecturing in Physics in the footsteps of his father at UNE.

Quiet, intelligent, good humoured. If there was one word to describe him it was that he was a gentleman, an eccentric, rather old-fashioned gentleman who loved jazz, red wine, large Cuban cigars and engineering seismology. His counsel and company will be missed for a long time.

FORTHCOMING CONFERENCES

- 27 – 30 June 2000. Western Pacific Geophysics Meeting, Tokyo Japan,
- 3 – 7 July 2000. The Australian Geoscience Convention, Sydney. One of the themes organised by Richard Hillis and Dietmar Muller is called: Defining Australia: The Australian Plate as Part of Planet Earth.
- 15 – 17 November 2000. *AEES* AGM and Annual Seminar in Hobart Tasmania. Organiser Vagn Jensen. The conference will include a visit to the Gordon Dam, one of the World's highest thin-arch concrete dams, and a dinner at a truly superb restaurant on the Hobart waterfront.
- 16 - 20 October 2000. Japan – 2nd Workshop of The APEC Cooperation for Earthquake Simulation ACES. Details next issue.

- 10 - 15 September 2000. European Seismological Commission, Lisbon Portugal. A workshop will be held there on "Historical Instruments and Documents in Seismology" (WSB-3).

- March 2001. The Australasian Structural Engineering Conference will be held on the Gold Coast.

- The 12th European Conference on Earthquake Engineering will be held in London in 2002.

REPORT: 12th World Conference on Earthquake Engineering, Auckland New Zealand - an Engineering Seismologist's perspective

At the 8th World Conference of the International Association for Earthquake Engineering (IAEE) in 1984, Dr Frank Press announced a new initiative that resulted in the UN's decade project for the 1990s; the International Decade for Natural Disaster Reduction. The IAEE's contribution to the IDNDR resulted in the World Seismic Safety Initiative which was declared at the 9th WCEE in Kyoto and Tokyo in 1988. The Association is also involved in the Radius project.

The IAEE World Conferences are held every 4 years, the 12th in 2000 was held in Auckland NZ and was organised by the New Zealand National Society for Earthquake Engineering. It coincided with final completion of the IDNDR. The winning New Zealand bid to host the 12th WCEE was announced in Mexico in 1996 at the 11th WCEE in Acapulco giving the NZNSEE just 4 years to make the necessary arrangements. AEES offered to assist and our members vetted submitted technical papers and also hosted or co-hosted several of the technical sessions.

More than 2050 delegates attended the conference from 74 countries and there were 6 parallel technical sessions. A format trialled in Acapulco was followed in Auckland in which most of the papers were poster presentations, the focus was on State-of-the-Art Plenary sessions and selected disciplinary based oral presentations. In a novel twist a debate was held on the Wednesday evening on the topic: That earthquake professionals are successfully meeting the challenges of reducing earthquake risk worldwide.

Even so the large participation and vast amount of information made it quite impossible for anyone to cover everything. The Industry stands were well attended and the poster presentations packed. The Proceedings were packed onto a CD which was distributed to delegates before the conference. Copies are available from the NZNSEE.

Dr Paul Somerville gave a State-of-the-Art presentation on Seismic Hazard evaluation particularly reducing the uncertainty which is an important factor for the new joint Loading Code. Mapping Recent faults is one of the ways to reduce the uncertainty in hazard estimates in Australia and New Zealand by both establishing the frequency of rare events and establishing a limit on their maximum magnitude.

Dr Shirley Mattingly's State-of-the-Art presentation was about successful projects worldwide which focussed on empowering communities to take responsibility for reducing their own risk from geohazards. She singled out the Pereira project in Colombia. The community was devastated by a magnitude 6.2 earthquake in 1999 but rallied and guided by Ana Campos put together a project which included rebuilding and a complete risk assessment including microzonation, building vulnerability and loss. All cities in Colombia with 10000 or more residents are required to do such a study but incorporation of the resulting spectra into the building Code is not yet mandatory (nor is it mandatory in Australia although LGAs may opt to so if they wish).

Considerable interest was shown in the new earthquake hazard source models for Australia, particularly from Canadian, Iranian and South African hazard assessment personnel who face similar intraplate modelling problems.

Victoria University's head of the School of Earth Sciences Professor Euan Smith and his PhD student Annemarie Christophersen presented a paper on their studies of the incidence of damaging aftershocks worldwide. This fitted in well with the Australian Earthquake Engineering Society initiative to provide a seed grant for a preliminary study of aftershocks in Australia.

One of the lessons of the Turkish earthquake was that communities were powerless to demand earthquake resistance in their buildings because of a lack of knowledge of the threat. We in Australia could be more proactive in educating children and adults via newspapers and other media though a destructive earthquake is not as likely to happen in our lifetime.

There is no substitute for data and the world's earthquake engineering community are clamouring for the (free) strong motion data recorded during the Turkish and Taiwanese earthquakes. Australian data are just as valuable but there are few free field instruments (mainly the JUMP program instruments) and even fewer buildings instrumented. The Commonwealth and State Governments should be made aware of the need for such instruments and to make the existing data readily available.

The Auckland conference was probably the best planned and executed conference of the five WCEEs I have attended since 1973, a tribute to Bob Park and his hard working committees.

The 12th European Conference on Earthquake Engineering will be held in London in 2002 and Dr Robert May from the British Society for Earthquake and Civil Engineering Dynamics has invited me to join the International Advisory Committee.

Kevin McCue

Encyclopedia of the World's Seismically Vulnerable Housing

At the WCEE in Auckland in January and February this year, the Earthquake Engineering Research Institute (EERI) and IAEE announced a plan to develop an encyclopedia of characteristic global housing construction types using a standardised

comparative form. EERI and IAEE are seeking project participants willing to contribute information on housing in their own countries.

The goal of the encyclopedia is to determine the seismic vulnerability of the world's housing (Ed. - and then, presumably, to make recommendations for strengthening the most vulnerable to reduce the risk of disasters).

NEW (& OLD) BOOKS / REPORTS

The Day the Earth Shook by Senior Constable Peter Holland recounts his participation in the recovery after the 1989 Newcastle Earthquake. Published in the March 2000 issue of the Australian Police Journal (Vol 54, No 1) it makes salutary reading for anyone with an interest in Australian earthquakes, particularly their effects on people and buildings..Copies \$3.50 from the Australian Police Journal at J Hawkins PO Box 45 Sydney NSW 2001)

Awesome Forces. Ed Geoff Hicks and Hamish Campbell. Te Papa Press Wellington NZ. RRP \$NZ29.95 (Great photos covering earthquakes to climate change with large IGNS contribution – a good read)

Perils of a Restless Planet. Ernest Zebrowski jnr. Cambridge Uni Press. RRP \$29.95 (Will both infuriate and educate you, an engineering and philosophical viewpoint on past disasters)

Australian Seismological Report - 1996 AGSO Sales Centre ph: 02 6249 9519, fax: 02 6249 9982

Acceptable Risks for Major Infrastructure. Eds P Heinrichs and R Fell, Balkema 1995. Proceedings of the Seminar on Acceptable Risks for Extreme Events in the Planning and Design of Major Infrastructure. Sydney NSW Australia, 26 - 27 April 1994.

Report on the January 17, 1995 Great Hyogo-Ken Nambu (Kobe) Earthquake. Lam Pham & M Griffith. CSIRO DBCE 95/175(M).

Isoseismal Atlas of Australian Earthquakes - Part 3 AGSO Record 1995/44, \$50 + pp. AGSO Sales Centre phone: 06 249 9519, fax: 06 249 9982

Earthquakes and Geological Discovery by Bruce Bolt. W H Freeman and Co., 1993.

Risks and Realities, Centre for Advanced Engineering University of Canterbury, Christchurch New Zealand. This book mainly presents the results of an investigation into the vulnerability of lifelines serving metropolitan Christchurch.

Seismogenic and tsunamigenic processes in shallow subduction zones, eds. J. Sauber and R. Dmowska, Birkhauser Basel, 1999. (reprinted from a recent issue of Pure and Applied Geophysics). US\$44.50.



Australian Earthquake Engineering Society

EARTHQUAKE ENGINEERING RESEARCH SCHOLARSHIP

The Australian Earthquake Engineering Society (AEES) is offering a scholarship of up to \$2,500 to suitably qualified persons to assist research activities related to earthquake engineering. Suitable research areas include most aspects of earthquakes and their effects.

Applications are welcomed from individuals fulfilling the following criteria:

- undertaking post-graduate or under-graduate honours research related to earthquake engineering that is consistent with the objectives of AEES;
- enrolled at the time of application at an Australian university;
- a current member of AEES.

No application form is required.

Applicants should provide the following information, briefly but clearly:

- a clear statement of the nature, purpose and probable outcomes of their proposed research;
- a detailed work plan and budget indicating the amount requested for the Research Scholarship (not to exceed \$2,500) and the manner in which it will be used;
- other sources of financial support of the proposed research;
- a brief curriculum vitae;
- a letter of support from a university staff member involved with the research project.

The Earthquake Engineering Research Scholarship would be awarded under the following conditions:

- the subject of study and the applicant are considered suitable by the AEES National Committee;
- the person who completed the application undertakes the research;
- the Scholarship is awarded for 12 months;
- on completion of the research project, or the portion of the project funded by the Scholarship, the Scholarship holder prepares a report for publication in the AEES Newsletter and presents a paper on the research to the AEES Annual Conference. Part of the Scholarship will be withheld until this condition is fulfilled.

The closing date for applications is 1 May 2000 and applications should be sent to:

Mrs Barbara Butler
C/- Civil Engineering Department
University of Melbourne
PO Box 829
PARKVILLE VIC 3052