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

1/2005

AEES Newsletter

with special supplement on Sumatran Earthquake and Tsunami

Contents

President's Column

Welcome and greetings to all our members to the first newsletter of 2005. I'm sure I speak for all members in thanking Kevin McCue for undertaking the role of editor of our AEES newsletter for over a decade, a great job Kevin for which we are all very appreciative. We warmly welcome Dr Nelson Lam on board as the new Editor and I'm sure you will all provide Nelson with support and contributions to the newsletter. Many thanks to our outgoing Adelaide Executive Committee (Mike Griffith, Peter McBean and David Love) for the excellent job in steering AEES over the past three years and for organizing two annual conferences during this period. The 2004 AEES annual conference held in Mt Gambier over the new Friday-Sunday format was a great success. Everyone was very pleased to see our secretariat Barb Butler back on deck and recovered from the severe fall experienced the year prior at the Melbourne conference. Members voted overwhelmingly to repeat the format for 2005 in Albury, a city with good air connections around the country and with relatively close proximity to Adelaide, Sydney and Melbourne.

The Boxing Day tsunami was a catastrophic start to the Christmas holiday period with the death toll continually climbing to over 200,000 and massive destruction to the coastline of many countries around the Indian Ocean. A very timely reminder of the power of nature and the obvious need for a warning system similar to that developed in the Pacific Ocean, which would have saved tens of thousands of lives. Our thoughts are with all those people affected by this horrific event. Reconnaissance teams from New Zealand, Japan and USA (EERI) undertook missions to gather data on wave heights, extent of inundation, effects to lifelines and impacts on communities from a social science perspective. Geoscience Australia, Bureau of Meteorology and Emergency Management Australia were the lead agencies advising the Australian Government, with a report to follow. Australia has provided substantial aid, Australian Defence Force personnel, and medical teams in association with some USAR (Urban Search and Rescue) task force personnel, whilst Engineers Australia's response was primarily offered through the RedR (Registered Engineers for Disaster Relief) organization. Most Australians were touched by the disaster and provided overwhelming financial support to a variety of international aid agencies.

The Boxing Day tsunami highlighted the need for AEES to raise community awareness in earthquake education in this country and to develop a response plan for emergency support and reconnaissance missions which could include the development of a register of professionals willing to be trained in undertaking reconnaissance missions and in assisting USAR taskforce teams. Our past President Dr Mike Griffith has been active in initiating the first training for South Australian engineers to assist USAR task force teams. Dave Brunsdon and Des Bull have developed Level 1 and Level 2 training courses for the engineering profession in New Zealand and are kindly assisting in the delivery of courses in South Australia. This is a significant development for AEES and could result in the roll-out of training for specialist USAR engineers around Australia over the next couple of years, with AEES co-ordinating the training and maintaining a register of engineers trained to either Level 1 or 2. The training of USAR task forces has been gaining momentum under the Secure Australia policy of the Government and has applications for a host of natural and technical events. We will provide updates of this initiative through the AEES newsletter.

The updated Earthquake Loading Standard AS1170.4 is almost ready for voting by Standards Committee BD/6. Provided there are no major impediments in this process, the Standard and Commentary should be released later this year. The process of updating the 1993 version of AS1170.4 has been slow, particularly after the original proposal of having a joint Standard with New Zealand was abandoned late in the period. Many thanks for the hard work and great stamina of Committee BD/6/11, all of whom are members of AEES, in developing the revised AS1170.4.

An AEES committee under the co-ordination of Kevin McCue are developing a proposal to obtain seed funding for replacing and improving the earthquake strong motion network in Australia that was initiated after the 1989 Newcastle Earthquake and known as the Joint Urban Monitoring System Project (JUMP). The Committee has been debating the scope, in particular whether to restrict the proposal to seismic monitoring and data collection/analysis or whether to extend and include earthquake risk mitigation. AEES will sponsor a face to face meeting to agree the scope, from which the proposal can be fine tuned through email exchange. Most members are keen to develop a seismic network in Australia, similar to the GeoNet project in New Zealand.

The Melbourne Executive Committee (John Wilson, Nelson Lam, Vaughan Wesson, Gary Gibson and Amy Brown and our secretariat Barb Butler) is looking forward to the challenge of leading AEES over the next three years. Good luck to all our members for 2005 and we look forward to future interaction, comments and feedback.

John Wilson - AEES President
February 2005

AEES Executive

President	John Wilson
Secretary	Amy Brown
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Qld	Russell Cuthbertson
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SA	Jim Wilson
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Newsletter Editor	Nelson Lam

Sumatran Earthquake and Tsunami: plea for contributions to recovery

If AEES members want to contribute to the recovery process in countries affected by the recent Sumatran earthquake and tsunami, the best way is to register on the following website : http://www.redr.org/australia/register/index.htm

RedR seems to be the lead agency working with IEAust and AusAID in the response and coming recovery phase of the disaster. People are already rebuilding their shattered communities and it is important that standards be followed or they will be building in the next disaster. According to Christine Vincent in RedR's Canberra office, the main need now is for geo-technical engineers but by the time

you read this I imagine that earthquake and structural engineers will be at a premium.

yours sincerely
Kevin McCue
February 2005

Recent changes to the administration of AEES include a change in management of the database and subscriptions. This will now be in the care of Engineers Australia and ALL members, whether they be members of Engineers Australia or not, will be issued with subscription notices by that organisation. Please direct any enquiries regarding subscriptions to Lois Wurzer at Engineers Australia

(email: LWurzer@engineersaustralia.org.au*)*

The mailing address for other matters remains the same (PO Box 829, Parkville, 3052) and to contact Barb Butler at the Secretariat the following details apply:

Email: barbyb@tpg.com.au

Ph/Fax: 03 9457 2877

Obituary : Emeritus Professor Robert (Bob) Park

Based on an Obituary presented by Les Megget in Vol.37(4) of the Bulletin of the New Zealand Society for Earthquake Engineering.

Professor Bob Park was born in Fiji, graduated at Canterbury University Christchurch with a BE in 1956 and a ME (with distinction) in 1958, and completed his PhD at Bristol University (United Kingdom) in 1964. Bob returned to Canterbury University and was promoted to Professor of Civil Engineering in 1968 at the young age of 35, and was Head of Department between 1978-1992 before becoming Deputy Vice Chancellor till his retirement in 1999. He was awarded an OBE in the Queen's Birthday Honours of 1995. There are many other honours and awards given to him.

Professor Park was a world leading figure in the field of earthquake engineering and has made important contributions both in New Zealand and internationally. He was Chairman of the Organising Committee for the 12th Conference on Earthquake Engineering held in Auckland in February 2000 and carried on organizing the conference even after suffering a major heart aneurysm 18 months before the conference began.

Professor Park died on the 3rd of November 2004. Over 450 attended his funeral held at Canterbury University. He will be missed by the civil and structural engineering community worldwide including many academics in Australia who have received immense support from him.

Obituary : Professor Frank Evison

Professor Frank Evison was one of New Zealand's longest serving seismologists. His contributions to the field span 40 years or more. Most recently he worked closely with David Rhoades in the field of earthquake forecasting. Frank died of cancer in late January 2005 after rapid decline from normal health, and his funeral was held in Wellington.

Report on AEES 2004 Conference in Mount Gambier

This year's conference attracted 61 delegates who listened to 31 presentations on topics of Earthquake Disaster Management, Engineering Seismology, and Earthquake Engineering. The conference was held over 3 days (November 5 – 7) at the Southgate Motel in Mount Gambier, South Australia. It was jointly sponsored by Geoscience Australia, Environmental Systems and Services, and the South Australian State Emergency Services. Without their support (financially and/or logistically) the conference would not have been possible.

The conference was highlighted by three keynote talks from

- Chief Inspector Peter Graham (SA Police Dept., Adelaide) on "The media – an influence for good or evil"
- Dr John Schneider (Geoscience Australia, Canberra) on "Towards a national picture of earthquake risk in Australia"
- Dr Hugh Cowan (Natural Hazards Group, New Zealand) on "New Zealand arrangements for monitoring, research and mitigation for geological hazards"

as well as a major session that gave a review of the upcoming changes in the "Australian Standard for Earthquake Loads" that will affect all building structures in Australia.

The conference proceedings (additional copies can be purchased by contacting Barb Butler at the AEES address above or by email at barbyb@tpg.com.au) include papers by all 31 speakers as well as written versions of several of the five poster presentations that were given during the morning and afternoon tea breaks.

It was also pleasing to note the media interest that the conference attracted. Local newspaper, radio and television all conducted interviews with various keynote speakers and members of the local organizing committee. I am also aware of at least one article in the Advertiser and one Adelaide ABC radio interview conducted during the week

In terms of answering the question "where to from here?" the conference probably posed more questions than answers. However, it was extremely pleasing to learn that some serious financial support from the SA government is in the pipeline to establish an Urban Search and Rescue capability in the state and that the Earthquake Engineering Society will play a lead role in providing USAR training for engineers. Furthermore, it is clear that while we continue to improve our understanding of Australian seismology and the corresponding models, there is still a very significant level of uncertainty in our quantification of earthquake "hazard". For example, we know that in Australia we experience around one (Richter) Magnitude 5.5 event each year, a Magnitude 6 every 5 years and a Magnitude 6.5 every 20 years. If any of these were to occur in or near a metropolitan area there would be fairly widespread damage. Hence, we all need to work harder to explain to funding bodies why investment in earthquake engineering and seismology research is justified. I'm not sure if this thought helps but it was reported in an American Society of Civil Engineers Report on the collapse of the world trade centre towers that if those buildings had just a little bit of the structural ductility and robustness that is common in seismically designed buildings they most likely would not have collapsed! Also, with all the uncertainties on the earthquake "demand" side of the equation it is probably still worth building in an extra dose of reserve "capacity" in our structures to ensure we don't experience widespread collapses in the event of a larger than expected earthquake.

Assoc. Professor Mike Griffith
(Past) President, AEES 10 November 2004

Col Lynam's Column

(Extracted from the daily blog of a "seismetrician")

The new AEES executive has arrived at a time to witness one of the world's greatest natural hazard calamities, caused by a phenomenon that is its expertise. How does it respond?

The **QUAKEWATCHERS – seismographs into schools**" project is one of the things that is preoccupying me lately. It's a joint "outreach" effort by the QUAKES Group (ESSCC Centre, University of Q'ld), me (Earthquake Services) and three participating schools, near Brisbane, together with individuals who have volunteered their expertise in curriculum, www formatting and Education Department workings.

I was further activated after reading this recent survey result*: **From Generation Y - Young people are not attracted to the resources sector because they do not understand what it does**, a new study has found. "The study has provided us with the information we need to sharpen up our efforts to recruit generation-Y. The study has shown that:*

- *Only a small proportion of high school students – in 22 of the 700 high schools in Queensland – are exposed to earth sciences as part of their studies.*

- *The mineral resources Sector does not have a high profile with Generation-Y and high school students have little knowledge of what it means to be a geologist or an engineer.*

- *Those who do enter the industry fall into one of three categories; they 'loved rocks' from an early age; had a family member in the industry; or had stumbled into the sector.*

"We cannot allow shortages of skilled people to constrain economic growth and industry development in the 'Smart State" said QRC Chief Executive, Susan Johnston." (in Q'ld Mining Journal Dec 2004).

I have found that school teachers are wildly excited and willing to participate in this "hands-on" science project that not only conforms to recent curriculum changes but also national policies of IEAust, AusIMM, DEST, and The Prime Minister's (PMSEIC) working group for arresting the decline in interest in science and engineering in school kids.

AEES is uniquely positioned (and charged by its

own constitutional objectives!) to outreach to the school teaching community, with our multidisciplinary expertise in science and engineering. AEES should promote itself as the link to our local, willing members able to speak to students. As the recent Sumatran Tsunami TV footage has showed, both locals and the tourists wandered down to the beach to watch the phenomena of the sea draining away from the beaches, oblivious of what that portended. There is a lot of public safety education to be done, right here in Australia.

In a newspaper clip (that I posted to the AEES list), one 11 year old British schoolgirl saved the lives of many (in a Thailand resort), by recognizing the imminent tsunami, from her school work on the topic, just a month beforehand. How many Australian lives would be saved if similar Natural Hazard "preparedness" subjects were more widely taught in our schools. As the article above says just 22 out 700 high schools in Queensland touch on Geology (or Geography).

It is just so easy to raise awareness and become an activist for what AEES stands for. If you value the professional ethics implicit in your membership and have a concern for your fellow humans, extend yourself. The funding resources available are currently immense. If you want some further ideas on "Outreach", have a look at the IRIS Seismologists (USA) website on the extent of their school focussed resources. (http://www.iris.edu).

In a similar way, the cessation of funding to our university seismological observatories and their aligned undergraduate teaching is having a serious effect on the education of engineers and earth scientists, about the actuality of risk of earthquake and tsunami hazards. About 10 years ago, I had to "break cover" and prevent the State Govt from building a toxic waste dump, at the mouth of the Brisbane River (1m ASL).

(Col Lynam (Earthquake Services) has over 35 years experience in observatory seismology, in Brisbane;

Reply to: lynam@uq.edu.au)

Col Lynam

Earthquakes in Australia

Earthquakes in the Australian region, Oct-Dec 2004.

More than 200 000 people around the northern Indian Ocean died in the earthquake and resulting tsunami that initiated off Sumatra on Boxing Day. Indonesia suffered the greatest loss. More Australians were killed than in any other earthquake, most of them in Thailand. Information may be found in other articles in this Newsletter.

A great earthquake near the Macquarie Ridge occurred fewer than 60 hrs earlier and was reported felt in Hobart and southern New Zealand but not on Macquarie Island.

An earthquake on 7 December offshore Central Queensland rated the highest magnitude of any Australian earthquake in the quarter yet was felt by no one. Three other earthquakes were of magnitude 4 or more but no damage was reported. Thanks to Geoscience Australia, Environmental Systems and Services and the Department of Primary Industries and Resources, SA for the information.

Kevin McCue

Date	Time	Lat	Long	M	Place
Oct					
07	14:14:18	36.853	121.192	2.8	Southern Ocean
11	12:25:27	30.879	117.098	3.1	S Manmanning WA
11	12:31:43	30.859	117.096	2.3	S Manmanning WA
13	08:30:35	32.538	149.299	2.2	W of Mudgee
15	01:07:49	19.849	134.058	2.2	SW Tennant Ck NT
15	21:52:47	30.563	117.015	3.0	Burakin WA
15	22:33:01	30.569	117.012	2.1	Burakin WA
15	22:43:21	30.561	117.018	2.6	Burakin WA
15	23:02:03	30.585	116.993	2.0	Burakin WA
15	23:02:56	30.564	117.007	2.1	Burakin WA
18	22:27:57	16.527	127.437	2.8	SW Kununurra WA
19	07:01:23	30.559	117.007	2.6	Burakin WA
21	18:16:40	22.041	130.973	2.4	W Yuendumu NT
22	23:37:31	32.398	117.042	2.0	SE Brookton WA
25	23:44:21	31.7	117.057	2.0	Meckering WA
Nov					
01	13:15:35	19.111	124.844	3.9	SW Fitzroy Crossing WA
06	06:45:35	30.657	117.431	2.2	N of Koorda WA
08	07:32:29	32.38	138.952	2.8	N Peterborough SA
09	19:05:20	19.788	133.997	3.3	SW Tennant Ck NT
15	19:19:46	19.876	133.981	2.3	Tennant Ck NT

source : Geoscience Australia obtained through Kevin McCue

It would seem to be a bit silly to spend all night safely tucked into an earthquake resistant bed, only to travel to school to be buried under a crushing wall of rubble. Come February 1st, children in Japan's schools will start seeing these 'earthquake resistant desks' from Kokuyo which are designed to withstand twice the amount of debris than older models. Unfortunately, they don't make it clear how much weight the old desks could handle.

source: Kevin McCue

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

Other News !

New Australian Standard for Earthquake Actions

The Draft Australian Standard for Earthquake Actions AS/NZS 1170.4 will soon go out to ballot. Drafting of the commentary is in progress.

NZ Standards on Earthquake Actions published

NZS 1170.5:2004 : *Structural design actions - Part 5: Earthquake actions - New Zealand Standard*

Provides procedures for the determination of earthquake actions on structures in New Zealand. It gives the requirements for verification procedures, site hazard determination, the evaluation of structural characteristics, structural analysis for earthquake action effects, the determination and limits for deformations and the seismic design of parts of structures. It is to be applied in conjunction with AS/NZS 1170 parts 0, 1, 2 and 3. Appendices cover aspects of ultimate limit state design and the requirements for material specific structural design standards that are able to be used in conjunction with NZS 1170.5.

NZS 1170.5:2004SUPP1 : *Structural design actions - Structural design actions, Part 5: Earthquake actions - New Zealand Commentary*

Provides background to the various provisions in NZS 1170.5:2004, suggests approaches that may satisfy the intent of the Standard and, if appropriate, describes differences between this and previous editions of the Standard. References are provided for further reading and these are given at the end of each section of the Commentary.

Strong Motion Network Proposal

The project proposal to establish a strong motion network in Australia is being prepared for the AEES committee and a meeting will be held shortly to discuss the draft .

Kevin McCue

USAR training course held in Adelaide

Information forwarded by Mike Griffith

The seminar was held on Thursday, February 17 and Friday, February 18, 2005. An initiative of the Government of South Australia and supported by the Commonwealth Government.

- Level 1 Engineers Course (8 hrs CPD credit): Dr Mike Griffith & Dr John Wilson
- Level 2 Engineers Course (12 hrs CPD credit): Dr. Des Bull & David Brunsdon

This is the first time that either of these courses have been delivered in Australia and is in response to the recognition that South Australia does not currently have a formal Urban Search & Rescue capability (although a number of emergency services personnel have had USAR training). The Commonwealth Government has provided matching funds to the State to assist with the establishment of an USAR Task Force and USAR trained engineers are a critical part of this team. Dr Mike Griffith and Dr John Wilson are past and current Presidents of the Australian Earthquake

Engineering Society, respectively, and have been involved in the delivery of specialist courses to engineers and emergency services personnel for several years. They will deliver the Category 1 USAR Engineer course with support from representatives from Emergency Management Australia and key State agencies. The CAT1 USAR Engineer course prepares structural and geotechnical engineers to work with emergency services personnel conducting surface rescue at structural collapse sites. Des Bull and David Brunsdon (both practising engineers and members of the New Zealand Earthquake Engineering Society) are well known for their work in pioneering the USAR Engineer Training scheme in New Zealand and will deliver the CAT2 USAR Engineer course which prepares engineers to work as part of a USAR Task Force in below surface ("under the rubble pile") rescue. These courses are free but there are only a limited number of places available. Persons interested in attending should register their interest with Mike Griffith at mike.griffith@adelaide.edu.au by February 14.

ARC Research Network for a Secure Australia

The Australian Research Council (ARC) Network for a secure Australia (RNSA) was launched by the Attorney General at Parliament House on the 24th of February, 2005.

Web address for details :
http://www.secureaustralia.org

Conferences and Seminars

Readers are urged to provide information to the editor on upcoming conferences and seminars. The editor wishes to acknowledge Kevin McCue for providing the following information.

- 2005/2/2-6 **2005 EERI Annual Meeting**
  Ixtapa, Mexico
  Contact: EERI, 499 14th Street, Suite 320, Oakland CA 94612-1934
  eeri@eeri.org
  http://www.eeri.org

- **2005/03/11-13 NZSEE Annual Conference,** Wairakei, New Zealand
  The theme of the conference is*: Planning and Engineering for Performance in Earthquakes*
  http://www.nzsee.org.nz/EVENTS/tcon05.html

- 2005/5/23-27 **AGU Joint Assembly** New Orleans, Louisiana USA. The Society for Exploration Geophysics organises sessions jointly with seismology and tectonophysics covering near surface geophysics topics ranging from reservoir characterisation to fluid flow around faults.
  http://www.agu.org/

- 2005/5/30-6/1 **Fifth International Conference on Earthquake Resistant Engineering Structures (ERES 2005)**
  Skiathos, Greece
  Contact: Katie Banham, Conference Secretariat, ERES 2005, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton, SO40 7AA, UK
  kbanham@wessex.ac.uk
  http://www.wessex.ac.uk/conferences/2005/eres05/index.html

- 2005/9/4-7 **Sixth European Conference on Structural Dynamics (EURODYN2005)** -
  Paris, France
  Contact: EURODYN2005, Laboratoire de Mecanique, Universite de Marne-la-Valle, 5 Boulevard Descartes, 77454 Marne-la-Vallee Cedex 2, France
  eurodyn2005@univ-mlv.fr
  http://www.eurodyn2005.univ-mlv.fr

- 2005/9/14-16 **: Structures and Extreme Events** - Lisbon, Portugal
  IABSE Symposium. Contact: IABSE Lisbon 2005, Organising Committee, c/o LNEC, Av. Brasil, 101, P-1700-066 Lisbon, Portugal.
  http://www.iabse.ethz.ch/conferences/lisbon2005/

- 2006/4/18-22 **100th Anniversary Earthquake Conference: Commemorating the 1906 San Francisco Earthquake**
  San Francisco, California
  Contact: EERI, 499 14th Street, Suite 320, Oakland CA 94612-1934
  eeri@eeri.org
  http://www.1906eqconf.org *or*
  http://www.quake06.org/quake06.html

Recent Journal Publications

· "Horizontal bending of unreinforced clay brick masonry walls," CR Willis, MC Griffith and SJ Lawrence, *Masonry International*, Vol. 17, No. 3, pp. 109 – 121, (2004).

· "Rational definition of the flexural deformation capacity of RC column sections," YF Wu, DJ Oehlers and MC Griffith, *Engineering Structures*, Elsevier Publishers, Vol. 26, No. 5, pp. 641 – 650, (2004).

· "Numerical simulation of steel plated RC columns," YF Wu, MC Griffith and DJ Oehlers, Computers *and Structures Journal*, Elsevier Publishers, U.K., Vol. 82, No. 4-5, pp. 359 – 371, (2004).

• "Experimental investigation of URM walls in flexure," MC Griffith, NTK Lam, JL Wilson and K Doherty, *Journal of Structural Engineering*, ASCE, Vol. 130, No. 3, pp. 423 – 432, (2004).

· "Earthquake Floor Spectra for Unrestrained Building Components", Abadi, HAA., Lam, NTK, Gad, EF and Chandler, AM, *International Journal of Structural Stability and Dynamics*. Vol.4(3): 361-377, (2004).

· "An attenuation model for distant earthquakes", Chandler, AM and Lam, NTK, *Earthquake Engineering and Structural Dynamics.* John Wiley & Sons Ltd., Vol.33(2):183-210, (2004).

· "Shear wave velocity modeling for crustal rocks for seismic hazard analysis", Chandler, AM, Lam NTK and Tsang HH. *Soil Dynamics and Earthquake Engineering*, Vol.25 : 167-185, (2005).

Special Issue : Performance Based Seismic Design (Ed. Nigel Priestley),
ISET Journal of Earthquake Technology, Vol.41(4), March 2004.

All papers published in the issue were by invitation.
Contact : "Vinay K Gupta" <vinaykg@iitk.ac.in>