



The Australasian Wind Engineer

www.awes.org

Welcome fellow Wind Engineers to the second AWES Newsletter of the year, and the first with your's truly, Leighton Aurelius, at the editors desk. It is also the first in a new electronic format such that we can be eco-conscious as well as informative. I certainly hope I can keep up the good work of previous editors in keeping everyone up to date and in the know of what's, to quote Bob Dylan, "Blowin' in the Wind."

There have certainly been some big events since the last newsletter. We have a new committee to see us through until 2008, and the election process in itself could fill this entire edition! Many of you would have also been present at the most recent AWES Workshop, held in Queenstown in February of this year, which not only showed some great research, but also how good, or bad for that matter, some of our contingents singing voices are!

There was also the sad news on the passing of Professor Arthur Chiu. Many of our members would have wonderful stories to tell about Arthur, and Professor Alan Jeary has provided a touching personal tribute to one of the founding fathers of our practice.

In terms of big events, Cyclone "Larry" occurred on March 20th this year, and Dr. John Holmes was on the scene and has provided a report detailing the event and the damage that resulted. And in terms of small events there are the usual titbits of information about people, upcoming conferences and other news. There's a lot on and we're already halfway through the year, so let's get the show on the road!

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View from the TSS Earnslaw of Walter Peak Station, 12AWES Workshop dinner



Effects of Cyclone Larry: March 20th, 2006

By John Holmes

Dr. John Holmes of JDH Consulting recently spent three days in the Innisfail district of North Queensland investigating the effects of Cyclone 'Larry' to buildings and other structures, shortly after the event. He accompanied researchers from the Bureau of Meteorology, Geoscience Australia, TimberED and the James Cook Cyclone Testing Station.

'Larry' was a small storm, with an eye about 20 kilometres in diameter, that crossed the coast at the mouth of the Johnstone River to the east of Innisfail. The storm moved quickly inland, which probably helped to limit the amount of wind damage. However, significant damage was experienced between Babinda in the north and Silkwood in the south. Storm surge effects were felt at Cowleys Beach, Kurrimine Beach and Mission Beach, on the south side of the track.

Although initially classified by the Bureau of Meteorology as a Category 5 cyclone at landfall, subsequent analysis of recorded wind speeds and the failure of simple structures such as road signs indicated that, in fact, it was a high Category 3, or low Category 4, event. The original assessment as a Category 5 was of considerable concern to Dr. Holmes, in his role of Chair of the wind actions sub-committee of Standards Australia, as the current design wind speed for ultimate limit states design on the Queensland coast (Region C) in the Australian Wind Actions Standard is at the Category 4 level. A Category 5 cyclone has never previously been recorded as crossing the Queensland coast.

For the general maximum gust wind speeds of 50-60 m/s (10 metres in open terrain) seen at locations near the eye wall of the cyclone, the performance of newer structures (built since Cyclones 'Althea' and 'Tracy' in the 1970s, and 'Winifred' in 1986 (also affecting the Innisfail area) was generally satisfactory. However, some newer houses on a ridge in East Innisfail had failed – probably due to the lack of account of the topographic speed-up effects, as required by AS/NZS1170.2.

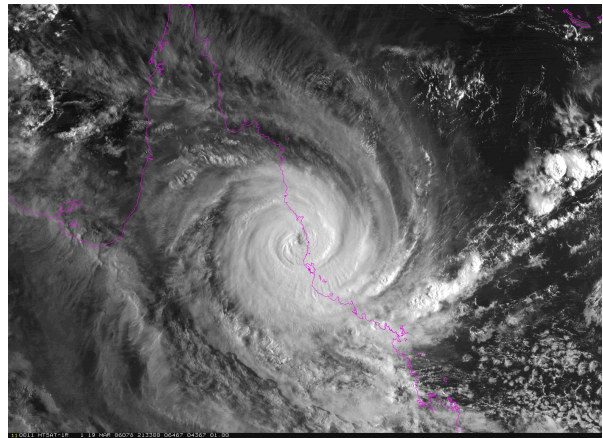


Image taken at 7:30am from *MTSAT-1R* satellite (Received and processed by Bureau of Meteorology courtesy of Japan Meteorological Agency)

Many older buildings had failed, however; the failures were very often attributed to the development of high internal pressures, resulting from debris damage to window glass, or the failure of roller doors due to direct wind pressure. The latter has been of particular concern to the Standards Committee for some time, and it is currently considering an amendment to AS/NZS1170.2 *requiring* roller doors to be treated as dominant openings for internal pressure assessment. This would be applicable to all types of extreme winds, not just cyclones. Unfortunately roller doors have a very poor track record in extreme wind events; John Holmes believes that it should be possible for manufacturers to supply cyclonic resistant locking/retaining systems for roller doors.

Prevention of debris generation due to roof failure of older buildings, and of small structures, such as garden sheds was important, as large debris items, flying at speeds approaching cyclonic wind speeds, had the potential to cause failure of newer buildings, that had themselves been correctly designed for wind loads exceeding those experienced.

The performance of engineered non-building structures was generally good in 'Larry', with the notable exception of a chimney stack at the Mourilyan Sugar Mill. The latter was apparently suffering from corrosion. Interestingly the chimney was equipped with helical strakes. The latter are effective at mitigating cross-wind vibrations at low-medium wind speeds, but would have significantly increased the wind loads during

the Cyclone, because of the increased drag coefficient. Failure of some small communications towers, including a mobile telephone tower were also observed during ‘Larry’.



Collapsed chimney stack - Mourilyan Sugar Mill,
(image courtesy of John Holmes)



Failed Road Sign – used to determine Gust wind speeds
(image courtesy of John Holmes)



Innisfail Hotel, with extensive roof damage
(image courtesy of John Holmes)



Failed Communications Tower, Silkwood
(image courtesy of John Holmes)



Near complete destruction of high-set house, East Innisfail
(image courtesy of John Holmes)

Detailed reports of the effects of Cyclone ‘Larry’ have been published by the Bureau of Meteorology (www.bom.gov.au), and will also be published by the James Cook C.T.S. (www.eng.jcu.au/cts) and Geoscience Australia (www.ga.gov.au).

AWES Committee News

After a lengthy election process, a string of emails, the disappearance and reappearance of Roy, and the notion that a certain former Iraqi dictator may have taken up Wind Engineering, the AWES committee for 2006 until 2008 was voted on, and thankfully democracy won through.

The committee is:

Chairman: John Cheung
Secretary: Roy Denoon
Treasurer: Graeme Wood
Records: Nick Locke
Webmaster: Michael Eaddy
Newsletter: Leighton Aurelius

Co-opted Member#1: Katrina Swalwell
Co-opted Member #2: Alex Loie

With the 12th International Conference on Wind Engineering being held on Australian shores next year all committee members are encouraged to voice their opinions and make suggestions, (in a democratic way of course) on the organising of this event to ensure it's success.

Conference Report

AWES Workshop, Queenstown, February 2nd to 3rd, 2006. (include days)

The most recent workshop was a spectacular success. The keynote speeches were met with great enthusiasm, and thanks again must go to Professor Barry Vickery and Professor Yukio Tamura.

Once again there was a great range of topics and it was encouraging to see some of our younger members presenting some great research.

On a social stance the workshop dinner was fantastic, with a great time being had by all on the TSS Earnslaw. Many thanks have to go to Mike Eaddy of MEL Consultants for his tireless work in making it one of the most memorable AWES events to date.

Upcoming Conferences

7th UK Conference on Wind Engineering, September 4th to 6th, 2006. University of Glasgow. (www.ukwes.bham.ac.uk)

12th International Conference on Wind Engineering, July 1st - 6th, 2007. Cairns, Queensland, Australia (www.awes.org/icwe12)

Employment Opportunities:

Windtech Consultants Pty Ltd

Graduate Position at Windtech Consultants

An exciting opportunity exists with WINDTECH Consultants Pty Ltd for a person with post-graduate research experience within the Wind Engineering/Bluff Body Aerodynamics discipline. Interested applicants should forward their CVs and a covering letter to Tony Rofail, Director, WINDTECH Consultants Pty Ltd by email: trofail@windtech.com.au

HKUST/CLP Power Wind Wave Tunnel

The CLP Power Wind/Wave Tunnel Facility at HKUST (<https://www.ab.ust.hk/po/vac.html>) has a number of positions vacant:

Research Associate (Ref: WWTF1)

A PhD degree in wind engineering, structural dynamics, engineering mechanics, fluid mechanics or aerodynamics. To conduct research and studies of fluid-structure interaction, structural dynamics, system identification for wind sensitive structures.

Research Associate (RAsso)/Research Assistant (RA) (Ref: WWTF2)

For RAsso, a PhD degree in wind engineering or other relevant field. For RA, a relevant degree and suitable candidate may enroll for a research higher degree. To conduct research and studies of wind-induced building motion and occupant comfort.

Engineer/Assistant Engineer (Ref: WWTF3)

A higher degree in wind engineering with experience in bluff body aerodynamics and wind tunnel model studies. To conduct research and wind tunnel model studies.

Research Assistant (Ref: WWTF4) (up to 2 posts)

A degree in aeronautical, civil or mechanical engineering. Knowledge of wind engineering and wind tunnel model studies desirable. Suitable candidate may enroll for a research higher degree.



Arthur N.L. Chiu (1929-2006)
A personal tribute by Alan Jeary



It is with deep sadness that I write of the death of Arthur Chiu. Art was not just a wind engineer, but he was (and this will come as a comfortable warm feeling to all wind engineers), a friend of wind engineering. I personally counted him as a friend, but I really mean this in the larger sense, he was a person who was easy to talk to; easy to get on with, and always had a perspective that was breathtaking. This didn't just apply to his professional colleagues, it applied to his students too.

On the 28th January of this year I received an email from his son Greg, saying that Art had had a stroke. In fact it had been a massive stroke. Art was an emeritus professor at the University of Hawaii at Manoa, and as was usual, he had been talking to a student late into the evening. As he made his way through the car park after the meeting he collapsed, and never recovered consciousness.

The career of Art Chiu spanned more than 4 decades, and he was one of the leading lights in wind engineering worldwide. During the vast majority of this time (42 years) he worked at the University of Hawaii at Manoa. He worked ceaselessly with students, to make them (where they had the ability) to become good engineers, and to help them in finding employment in local and mainland companies.

To those who were not going to make good engineers, he helped to identify where their real skills lay, and helped them to find other fields in

which to develop their talents.

He produced his PhD dissertation in 1961, and at a time when wind engineering was just poised to enter the modern era of understanding, he investigated not just the gustiness of the wind (which he termed 'wind pulses'), but also the dynamic effects on structures. Indeed it was in the international arena, working with the effects of wind on structures, that he made an enormous impact.

He was an early pioneer of making full-scale measurements, and played a very large part in validating methods of testing structures in wind tunnels. Without such a validation, the correlation between predictions and real responses were, potentially, so poor, that the entire exercise would otherwise have been futile.

Being based in Hawaii, it became evident to Arthur, that there was a considerable amount to be gained from a full research cooperation between the US and Japan. Together with Dr. Hatsuo Ishizaki, he set about arranging for regular US-Japan conferences on wind engineering. The results of this cooperation have been enormous, with engineers on both sides of the Pacific newly enthused with ideas after each round of conferences.

Arthur became heavily involved with hazard mitigation. This involved work on both wind and earthquake problems, and as President (1996-2002) of the Applied Technology Council (ATC), he made sure that current research was passed quickly to practitioners, rather than waiting for codes of practice to reflect the new knowledge.

Arthur was the epitome of the perfect engineer/academic. He managed to appreciate both sides of the coin, and to provide a brilliant link between the theorists and the practitioners. His attention to detail was legendary.

His family, but especially Greg, his son, arranged for a 'celebration of life' in Honolulu in March of this year. It was a large event, and it included guests from all over the world. It was very apparent that Arthur Chiu had left a large impression on many people throughout his life.

People spoke of all aspects of his life, his early years, his difficult life in the war years in Singapore, of his degree and his guest teaching at the University of Hawaii, where they made him an



offer he simply couldn't refuse. He was then based there for the rest of his professional career.

Arthur's life was structured around his professional pursuits – being available for students, being involved with codes, funding and with Chi Epsilon. He served as the National Chair of Chi Epsilon, as a Member of the Board of Directors of the Applied Technology Council, and Chair of the National Research Council's Committee on Natural Disasters. In 1982 he was awarded the University of Hawaii Award for his accomplishments as a teacher and the Hawaii Council of Engineering's Lifetime Achievement Award.

Arthur and I had met several times at conferences in various parts of the world. The professional relationship soon grew into a much deeper friendship, as we were drawn together from a common interest in the way structures behaved in the wind, rather than as being in the aerodynamics area of the subject. At the last wind conference, in Lubbock, Art and I were constant companions, interacting especially with the Japanese colleagues that he had worked with so often over the years. He was there when I met Yvonne who I would later marry.

Greg, his son, and I also got on extremely well, and formed a company that works on Structural Integrity assessment. The advice of Arthur, in the background, was always welcome, had enormous perspective, and was always well received. After I had delivered a short speech, at the Celebration of life, I received a hand-written note from Greg, to thank me, and when I commented on how much it meant to receive thanks in that form, Greg told me that the touch was a product of his father. The very personal touch spoke volumes of the effect that Arthur Chiu had not only on the people he met and interacted with, but also on the generations to come. It is one of the highlights of my life to have been . the 'meat in the sandwich' of the "Chiu, Jeary, Chiu" paper.

Arthur, we will miss you, your dedication, your warm good humour, and that enigmatic smile, and wind engineering is the poorer for your absence.

Aloha.

PEOPLE

- **Melissa Burton**

Our congratulations go to Melissa Burton of HKUST on completion of her PhD thesis, and her move to join Ove Arup & Partners' Advanced Technology Group in London.

- **Leighton Aurelius**

After 6 years at Windtech Consultants in Sydney Leighton Aurelius has recently joined BMT Fluid Mechanics in the UK.

Well, that's it for this edition of the AWES Newsletter. Many thanks to those who contributed. I hope that the new electronic format works for everyone and feedback is always welcome.

A newsletter cannot exist without news, so any stories, photos or information on upcoming events will always be appreciated.

Cheers,

Leighton Aurelius
AWES Newsletter Editor.

Disclaimer: The articles appearing in The Australasian Wind Engineer are obtained from many sources and do not necessarily represent the views of the Editor, Committee or Members of the AWES.

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