Dean's Spot

Did you know that one of the world's most respected and influential Monarchs is a Professional Engineer? We have always said that an engineering degree is an excellent preparation for any career! This month we celebrate the birthday of Thailand's revered King, His Majesty King Bhumibol Adulyadej. His 73rd birthday was on December 5th and this year also marks the 55th year of his rule, making him the longest serving monarch in the world. He has many talents and has had a lifelong enjoyment of music, nature, the environment, photography, and has always been fascinated by how things work. He has an engineering degree from Switzerland – in fact his coronation was delayed so that he could complete his degree.

His Majesty the King is immensely respected by his subjects as “The Light of Thailand.” His reign is characterised by remarkable wisdom, thoughtfulness and compassion. Thailand is indeed fortunate in having someone of such calibre providing such sustained wisdom and guidance to its people.

Two of our senior Thai students will receive their PhDs in Engineering at the Wollongong University Graduation Ceremony on Thursday 14th December. Both are currently in academic positions at Naresuan University in Thailand and were recipients of Thai government scholarships. They are Panu Buranajarukorn and Chai Pongpattanasili and their supervisors in our Faculty were Professor Guenter Arndt and Associate Professor Peter Gibson. They did their research on topics to assist Thai Industry. Panu studied Thai small and medium enterprises and made some recommendations for improving international competitiveness of Thailand through proposed government programs aimed at the sector. Chai studied the Thai food industry and researched ways of making several practical improvements to assist these businesses. We wish them well in their professional engineering careers in Thailand and they certainly have one of the best possible engineering role models they could ever wish for in King Bhumibol Adulyadej.

Creative Design Competition

On Friday, 10th November, the Final Judging of the successful 2006 Creative Design Competition took place. Close to 100 staff, students, sponsors, parents and supporters listened to well-prepared presentations from the six Finalists.

The results of this year’s, the 36th consecutive Competition, are:

- Overall Winner: 3-D Crack Calliper, sponsored by BlueScope Steel
- People’s Choice: Crowd Control Barrier - sponsored by the Faculty of Engineering
- Best Model: Non-Pneumatic Puncture Proof Shock Absorbing Bicycle Tyre - sponsored by Industrial Timber Services
- Best Oral Presentation: Train to Platform Extension, sponsored by the Illawarra/Sutherland Regional Group of Engineers Australia
- Best Technical Solution: Jack-in-the-Box, sponsored by PHD Engineering

The organisers of the Competition would like to thank all the sponsors for their generosity in providing the funds for the prizes and their staff for acting as judges and presenters at the Final.

Also, thankyou to Marina Evans for the excellent job coordinating the various activities and pulling them together on the evening of the Final.

Train extension platform, winner of the prize for the Best Oral Presentation.

Contents

- Rail Track Research
- UoW Researchers Awarded by Institution of Engineers
Rail Track Research

The cutting-edge research conducted by Prof. Buddhima Indraratna, Dr. Hadi Khabbaz and their recent students (Dr. Joanne Lackenby and Dr. Wadud Salim) on ballast and track degradation under high speed heavy haul trains has transformed the way in which modern tracks should be designed. The revised NSW standards for ballast selection and the use of polymeric grids and textiles (geosynthetics) to reduce the fracturing of ballast and minimise track settlements will allow increased average train speeds at maximum loading. The research techniques also promote the recycling of used aggregates on track reducing the need for fresh quarried rock and unwarranted environmental degradation, whereby the performance of used (recycled) ballast is improved with the placing of geosynthetics underneath the ballast layer. Internal drainage of the track can also be improved with appropriate geo-textiles placed above the soft foundation soil.

With the keen cooperation of RailCorp lead by David Christie (Senior Geotechnical Adviser), several new tracks and the maintenance of existing tracks have already implemented these innovative concepts through a major field trial. Following the plans from UoW, RailCorp have installed instruments into a section of track to monitor the Ballast-track-foundation interaction to assist in the validation of the research work at UoW and to further the development of computer-aided models for design and maintenance of the track.

The photos show a significant undertaking at Bulli where the research findings from UoW team are put in place. Field monitoring indicates excellent track performance, and the ongoing field work will be used to further improve the current design techniques.

UoW Researchers awarded by Institution of Engineers

Associate Professor Michael Boyd from the School of Civil, Mining & Environmental Engineering and his PhD student Dr. Nanayakkara Bodhinyake have been awarded the 2006 GN Alexander Medal by the Institution of Engineers Australia. The Medal honours the eminent hydrologist GN Alexander, a pioneer in statistical hydrology. The GN Alexander medal is awarded at each Hydrology & Water Resources Symposium of the Institution of Engineers for the best paper published in the field of Water Engineering since the previous symposium. This year, more than 200 papers were eligible and 8 were short-listed for the award. Michael and Nanayakkara’s award was for the paper WBNM Runoff Routing Parameters for South and Eastern Australia, published in the Australian Journal of Water Resources in early 2006.

The paper analysed a large amount of flood data from the eastern states of Australia, and investigated relations between flood parameters and a range of catchment physiographic and climatic properties. The paper also brought together information from a range of diverse sources to confirm these relations. The results will allow computer models to be used to predict flooding in a wide range of catchments. The computer model used in the study, WBNM, has been developed over many years by a team of academics and consulting engineers led by Michael.

Season’s Greetings and Best Wishes for 2007