

Engineering Tasmania

February 2010



ENGINEERS
AUSTRALIA
Tasmania Division

Newsletter of Engineers Australia, Tas Division - Royal Engineers Building, 2 Davey Street Hobart
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PRESIDENT'S REPORT



Hi all,

As this is my first report, I should do the obligatory introduction for those who don't know me. I am a civil/structural engineer heading into my 30th year since graduating from UTAS. I am married to Christine and have two teenage daughters Jessie and Sally. My experience includes 6 yrs with DIER (or actually the DMR as it was then called); 11yrs with Hazell Bros Civil Contracting; and Johnstone McGee & Gandy inc. Dale P Luck & Associates (quite a mouth full!) in Hobart for 12 yrs where I am Principal.

With the formalities over, my first task is to again thank Mike Brewster for his

efforts as President of the Division last year; his leadership was outstanding, at a time when he was effectively doing two jobs concurrently. I will be following Mike's example of setting a limited number of priorities, and will be seeking assistance from other wise heads during my year as President. One of my first duties was to attend the November meeting of Engineers Australia Congress along with Mike Green and our Division Director Geoff Harper. This two day meeting in Canberra was organised to coincide with the presentation of the Australian Engineering Excellence Awards, and it was a great thrill to have a Tasmanian project win one of the awards – congratulations to the Hydro Tasmania / Alstom team which triumphed with their World Class Hydro Machine Operation project. I have already asked Fabian Kaica of Hydro Tasmania to share some of their knowledge by giving a talk during this year.

We have a fairly exciting and full year ahead, with the "Make It So" campaign already exceeding expectations in terms of signing up advocates, but this is only the first step and I would ask all of our members to help support the campaign which will seek to highlight the value of engineering. This will hopefully result in more enrolments in engineering courses which is one step toward addressing the engineering skill shortage we currently face which is predicted to get worse as the number of retirements will exceed the number of graduates and immigrants over the next few years.

Last year one of the priorities was the Engineering Initiative program, for which Martin Stalker received a special award at the Tasmanian Engineering Excellence Awards. This year I certainly wish to continue to support this program however I am aiming to

widen that priority to include all student promotions of the engineering profession. There are numerous programs such as the Engineering Initiative, EngQuest, Tournament of Minds, Science and Engineering Challenge, Model Solar Car and Boat Challenge, F1 in Schools, and many others. What I hope to achieve is a consolidation of all these activities onto a relevant link on our Division web site, and to provide appropriate support (such as volunteer judges, advisors etc.) for the various programs.

Another priority must be the support of our various Tasmanian branches, although the recent history is that the Women in Engineering group and the Young Engineers Australia - Tasmania group have struggled to find volunteers to help run their programs, I believe the issue of providing sufficient volunteers goes across all our groups. For example at the AGM at which I was "elected" as President, there were in fact no votes required for any of the positions as there were no multiple nominations for any of the various positions on the committee. While this saves time, it does not point to a good turnover of volunteers (we all have our various use-by dates) and we are certainly over represented by the "baby boomers" around the table at meetings. Like most things in life, the more you put in, the more you get out. If you feel you would like to know more about what you may be able to do, please contact Catherine or Geoff at the office and they will put you in contact with the relevant person.

My other priority for the year is to make some progress on road safety in Tasmania, I recently read with great disappointment a letter to the editor of The Mercury which effectively stated that people will always die on the roads and there is nothing we can do about it. Having sat around the table with the

President's Report cont

National Committee on Transport Engineering last year, there are a number of technological initiatives that would reduce the road toll immediately. As one engineer said, if the car was invented today, it would not come out anything like what we currently accept on the roads. With the adaptation of currently available technology (i.e. we don't need to invent anything new) I can imagine: a car with handprint technology that recognises that a driver has a suspended (or no) licence and simply will not start; an intoxicated driver would also find his car won't start; a speeding driver would find that once he reaches the posted speed limit his car won't go any faster; a hooning driver would find he can no longer do burnouts or doughnuts as the car reacts once traction is lost; and the car will not go without all occupants having their seatbelts correctly fitted. Road safety is an emotive issue, however people shouldn't have the "right" to endanger themselves or other road users, governments will only react to pressure from the community so we must assist in educating the community that there is in fact much we can do to reduce our road toll. It is not only fatalities but all of the serious injuries as well which, according to the government's own figures, costs Tasmania \$500 Million every year – If we reduced that to nil, we could afford a new Royal Hobart Hospital every two years!

Another major activity this year is the update of the Tasmanian Infrastructure Report Card, last done in 2005. I'll cover that further in future editions, but I must thank all those who agreed to assist with reviews of the various chapters.

If you have read this far, thank you, so to summarise my 5 key priority areas for the year are:

- Road Safety
- Engineering Career Promotion Programs
- The National Marketing Campaign (including Make it So)
- Consolidation of and support for the various branches
- Infrastructure Report Card

Grant Atherton, FIEAust CPEng

2009 Rod McGee Medal Winner



Elizabeth Smolinska receives the Rod McGee Medal from Grant Atherton, member of the Civil College Board

Final year RMIT honours student Elizabeth Smolinska has received the 2009 Rod McGee medal.

During her university studies she has developed a keen interest in water and transport engineering. For her final year project she has conducted a stormwater harvesting and reuse investigation and design project at Melbourne and Olympic parks.

Earlier this year Smolinska participated in a research project in Vietnam on flooding adaptation and mitigation strategies. She is an active supporter of Engineers Without Borders and hopes to use her skills to work on international aid projects.

"Rod McGee's life story is a great example of the important and valuable work that can be done in public works engineering" Smolinska said.

The Rod McGee Medal was established by Engineers Australia to commemorate the contribution of Dr Rod McGee to Australian public works engineering, and to encourage final year engineering students to embark on a career in public works engineering.

The award is jointly sponsored by the Tasmanian Department of Infrastructure Energy & Resources and Johnstone McGee & Gandy. It consists of an engraved medallion and a \$2,000 prize.



HYDRO TASMANIA WINS A NATIONAL ENGINEERING EXCELLENCE AWARD



Receiving their Excellence Award were (l-r) Fabian Kaica, principal mechanical engineer at Hydro Tasmania; Stephen Mole, manager at Alstom Power Service; Enes Zulovic, senior mechanical engineer with Hydro Tasmania and Mark Hollick, project co-ordinator with Alstom Power Service

Hydro Tasmania's \$18 million upgrade of the 62MW Unit 1 Pelton Machine at Poatina powerstation from 2008 to 2009 delivered the lowest vibration levels ever achieved by the company.

The project applied engineering practices developed and continually improved by the company over the past 10 years in its aim to reduce hydro machine vibration levels to what is considered world's best practice.

These improvement practices will be progressively applied across Hydro Tasmania's fleet of 52 Hydro machines.

The application of new engineering practices reduced the outage time by 15 days, saving about \$500,000. The shaft realignment correction phase took two days, compared to 21 days for the Trevallyn Unit 4 in 2004, 14 days for Gordon Unit 2 in 2006 and 7 days for Poatina Unit 4 in 2007, showing continuous improvement. The operating benefits include reduced machine wear including metal fatigue on Unit 1.

Before the upgrade, machines 1 to 5 at Poatina were unreliable because of component wear, inherent design problems and lack of maintenance. The upgrade will improve reliability, producing a life cycle cost saving of up to \$5 million over the next 30 years.

The new turbines will deliver an estimated 6% turbine efficiency gain, meaning less water is needed for the same amount of electrical energy, preserving the water in the Great Lake.

Another aim was to solve the oil loss from the turbine guide bearings under some transient shutdown conditions. A new turbine guide bearing design was developed with Michell Bearings UK. This has resulted in no oil loss in practice under the most arduous transient load conditions, improving downstream water quality.

The machine now runs smoothly at a full load of 62.5W with a turbine bearing shaft orbit of 70 microns peak to peak (ie, 0.070mm shaft throw at the turbine drive end). All data and information was sent to hydro machine alignment and vibration expert Doug Franklin who has 33 years experience including working as a senior mechanical engineer for British Columbia Hydro in Canada. In his independent comments, Franklin remarked the result was world class and so smooth the engineers were measuring surface defects on the shaft.



A runner being installed at Poatina powerstation

The Tasmania Division congratulate Hydro Tasmania on being one of 6 Excellence Award winners from 58 entries

2009 Alan Burn Memorial Lecture

“Engineers have Hearts as well as Heads”

Bill Lawson, AM FIEAust CPEng
10 & 11 November 2009



The full text of Bill's Alan Burn Memorial Lecture is available on the Tasmania Division website and is located under the “Resources” section

Floating Bridge; both of which experiences I have shared during my career. Significantly, Burn is noted to have taught his students that the Professional Engineer needs to be a community leader. He was also particularly noted for his view that education should encourage moral as well as mental development. I could not agree more.

Bill's view of the future was:

I am very optimistic about the emergence and maturing of ‘Triple Bottom Line (TBL), CSR and the consolidation now occurring which is seeing the Private Sector invited into community spaces and issues which have previously been to domain of the Public and Community Sectors. I believe bringing the Private sector's innovation and problem solving outlook into the established mix of compassion and care by the Community Sector and good governance and reliability by the Public Sector is seeing a greater balance and sorely needed ‘circuit breaker’ for intransigent challenges. I am delighted to be part of this metamorphism.

I am equally enthusiastic about the potential for getting Engineers more involved in community issues as that will bring our analytical, problems solving outlook to bear on issues which have hitherto escaped our attention. However for this to happen there needs to be changes on both ‘sides’;

- Engineers need to listen to their heart and give expression to its sentiment and passion through their head based skill sets. We need to be willing to put

ourselves forward, even demand to be involved in issues of concern within our local communities.

- The ‘Community at large’ needs to come to the point of recognising that the daily ‘miracles’ which permeate their lives and are easily taken for granted – telecommunications, transportation in all its forms, energy at the flick of a switch, tap water to drink, waste collection/treatment/disposal, to name a few - have been caused by upstream interventions, often by Engineers and their teams.

Then the community needs to realise that such miracle workers may also have something to offer in resolving the troubling and persistent community issues of the time and place.

In my view, Engineers hold the initiative on both counts and need to be proactive and perhaps unconventional to get these two things to happen. I have tried to suggest some of the things I think we need to do and have attempted to give the reasoning behind my suggestions. I note that this appears to align very closely with what Alan Burn was espousing more than half a century ago! My hope is that more Engineers will, in the future, allow their hearts to drive their heads a bit more. If they do, then I think that both Engineers and the wider community will reap very substantial and sustainable benefits. To achieve this though, the Engineering profession has work to do to better inform the whole community.

In the lecture, Bill reflected on the challenges facing the professional Engineer today in serving the community in both a technical and social sense. Bill asserted that Engineers have much more to offer in the social sense than has been traditionally been expected but that for that to happen attitudes and expectations need to change on both ‘sides’. The lecture created a nexus to the emerging importance of Corporate Citizenship in building and maintaining sustainable business in Australia today and into the future by reflecting on the aspirations and expectations of clients, staff and the wider community.

Bill illustrated his lecture with examples drawn from his own career in both a technical and social sense; in particular his conception and establishment of the Beacon Foundation as well as his more recent and current work with SKM in setting and delivering the Company's direction in both Indigenous and Corporate Social Responsibility (CSR).

He commented on several intersections with my own career and that of Alan Burn. Alan Burn was, amongst many other things, a Bridge Engineer with notable contributions to both timber bridge technology and Hobart's



Australian International Model Solar Car Challenge Report

The Australian International Model Solar Car Challenge is over for another year and, as usual, the performance of the Tasmanian team was something of which they can all be proud. This year the event was held at Scienceworks, Melbourne, over the weekend of 28-29 November.

Due to the late withdrawal of the two Taiwanese teams and the lack of any entries from South Australia and the Northern Territory, Tasmania was given six entries. We had two cars each from Queechy High School and St. Patrick's College, and one each from Rose Bay High School and MacKillop College. They were joined by teams from New South Wales, Queensland, Victoria, Western Australia and this year, Iran.

Weather conditions over the weekend were trying at times, ranging from a downpour to brilliant sunshine in a matter of minutes, a bit like Hobart weather.

Saturday saw elimination races to choose wild cards to bring the field up to the required 32. Then all cars were put through a thorough and comprehensive scrutineering. Once again, all Tasmanian teams passed through without any trouble, more than can be said for a number of entries. It always makes me wonder how a car can get through the relevant state event yet be so far outside the regulations.

After scrutineering all cars raced in groups and their times corrected against the prevailing light. A computer programme developed by former Tasmanian competitor, National champion and now UTAS engineering student, Marc Iseli, was then used to seed the cars while ensuring that cars from the same state did not clash in the early rounds, yet the same school could not take both first and second places. It worked superbly and has been adopted for all future events.

Then all the teams were invited to a free show in the planetarium and a very informative talk about the Toyota Prius given by an engineer from Toyota Australia. A free BBQ followed.

Sunday dawned fine but the track was a giant swimming pool. While the track was dried out all cars were quickly re-checked to ensure no illegal modifications had been made overnight. Then it was best of three sudden death racing. After the first round the 16 eliminated cars were further raced in the Plate event. This was easily won by Hot Chilli from Queechy after they had overcome the initial bug that had seen them perform below par in the early races. A collective gasp went around the course when, after Hot Chilli had easily won the final Plate race, the other car left the track and crashed heavily onto Hot Chilli, completely breaking off the front wheel. Being totally blameless, Queechy was granted extra time and assistance to effect repairs.

Again, Marc Iseli has developed a system where the Plate winner has the opportunity to get back into the main competition. After the liberal application of super glue and duct tape Hot Chilli was able to get back into the top 16, joining Team Extreme from St Patrick's and Racing Stripes from Rose Bay.

Hot Chilli's repairs held up and they progressed easily into the semi-finals. Team Extreme came to grief in the quarters but excellent team work saw the car placed back on the track and, despite collapsed front suspension and a dragging front wheel, were able to win the race against the 2007 champions who also had problems and were unable to complete the course.

This put the two Tasmanian teams into the semi-finals. Team Extreme could not be repaired in time but still managed to complete all its races, albeit at a much reduced speed, to take a highly creditable fourth place at their first attempt. Hot Chilli was obviously affected by the hasty repairs but put up a good showing to take third place overall.

First place went to a year 12 team from Moorebank High, NSW, and second place went to another year 12 team from Box Hill High, Victoria. Both of these are specialist technical high schools and have competed at the highest level for many years. If you take into consideration the ages of the Tasmanian teams then they performed extremely well.

So, the final outcome was this, Tasmania picked up:

Third place overall
Fourth place overall
First place Plate competition
Best Poster award
Best Team Uniform



Our extremely talented Tasmanian team in Melbourne

On behalf of all the team members I would like to thank our sponsors and assure them that all our funds are passed on to the team members to assist them in getting to the National competition. A number of states received several times our funding but failed to send a single team to the Nationals.

John Jeffery
Tasmanian Model Solar Challenge.
Australian International Solar Challenge.

YOUNG ENGINEERS



*Sandra Thaow, GradIEAust
Chair,
Young Engineers Tasmania*

new minds
new ideas.



Greetings and welcome to 2010 with Young Engineers. I hope the Christmas and New Year break finds everybody refreshed and ready to launch into the year.

Having been a member of the Young Engineers Committee for the last three years, I find myself taking over from James Porter and stepping into the position of Chair of Young Engineers for 2010. Although the thought of being Chair seems slightly daunting at times, I look forward to the challenges and the opportunities that this position presents and find it ironically fitting that 2010 is the Year of Engineering Leadership.

I am also pleased to present your Young Engineers Committee members for 2010:

Sandra Thaow, GradIEAust – Chair
Bex Dunn, GradIEAust – Vice Chair
James Porter, GradIEAust – Immediate Past Chair
Jess Andrewartha, GradIEAust – National Rep
Ben Johnston, GradIEAust
Rodney Bussey, MIEAust
Tom Veit, StudIEAust

2009 saw a great range of events from Young Engineers, ranging from networking opportunities and professional development sessions to a number of fairly memorable social events such as beer tasting at Barcelona and, in conjunction with Women in Engineering, Gen²X at Hadley's Hotel.

2010 promises to be just as successful and deliver some more targeted events that cater for the diversity of our members. First up this year is the launch of the Year of Engineering Leadership with a breakfast event on Wednesday the 17th of February. The joint CELM and YEA **Engineering Leadership Breakfast: Be the Change** celebrates leadership and its pursuit at all levels of the engineering profession.

We're encouraging all young engineers attending this event to bring along a senior engineer or mentor. This event is **FREE** to all members of the engineering profession so if you're interested in attending, please RSVP to Catherine Reading by Wednesday, 10 February 2010 on 6 2 3 4 2 2 2 8 or creading@engineersaustralia.org.au

For more information on the breakfast, please refer to the advertisement on the opposite page.

Not long after the breakfast event is a University Welcome BBQ for our student members before launching into our calendar with events such as Speed Networking, Meet the Profession and CPEng Workshops. We also hope to get Jenny O'Donovan, the EA National Careers Manager, to run some sessions on document writing techniques and presentation skills for our student

and graduate members. Watch this space for more information regarding these events.

Every year when the Committee sits down to plan our event calendar, I wonder how on earth we are going to find the time to organise and run the number of activities that we do and get the right variety to interest our members. Every year I am amazed and inspired by the time, effort and energy that my fellow Committee members put in to organise these events for the benefit of our peers and colleagues, past, present and future.

If you are interested in contributing back to the profession by becoming a member of the Young Engineers Committee or would like some more information about what is involved, please contact me via email:

yeatas@engineersaustralia.org.au

Young Engineers has also put out the **Call for Australia's Most Inspiring Young Engineers**. The winners will be announced at the Engineering Leadership Conference in May.

To find out more, visit www.engineersaustralia.org.au/yea

**Sandra Thaow, GradIEAust
Chair, YEAT**

Engineering Leadership Breakfast

Be the Change

YOUNG ENGINEERS AUSTRALIA TASMANIA (YEAT) AND
THE CENTRE FOR ENGINEERING LEADERSHIP AND MANAGEMENT (CELM)

Wednesday 17 February 2010

7:45 am – 9:00 am (Arrivals from 7:30 am)

Mawson's Waterside Pavilion

FREE to Members of Engineering Related Professions

RSVP ESSENTIAL by Wednesday 10th February 2010



www.engineersaustralia.org.au

YEAT and CELM Tasmania invite you to attend the launch of the Year of Engineering Leadership.

The objective of the event is to celebrate leadership and its pursuit at all levels of the engineering profession.

Greg Walters, State Manager of Sinclair Knight Merz Tasmania, will be presenting at the event, followed by opportunities to mingle over breakfast.

This event is free to all members of engineering related professions.

RSVP to Catherine Reading by Wednesday 10th of February 2010

Phone: 03 6234 2228 Fax: 03 6234 2216

Email: CReading@engineersaustralia.org.au



Greg Walters FIEAust CPEng EngExec is the State Manager for Sinclair Knight Merz Tasmania (SKM).

After 19 years in the Australian Army, Greg joined SKM in 2001 to set up their national Defence business. Since then he has held a variety of senior management roles, including Country Manager India.

Greg has been an active member of Engineers Australia over the years, starting with his involvement in Young Engineers. He served various roles including President of the Canberra Division of Engineers Australia and National President of the Australian Society of Defence Engineering.



www.engineersaustralia.org.au

How you can celebrate the Year of Engineering Leadership

The success of the Year of Engineering Leadership is dependant on our members. Help Engineers Australia support the Year by:

- Acting as an Advocate for the Year of Engineering Leadership
- Acting as an Advocate for the 'Make It So' campaign.
- Supporting or organising Year of Engineering Leadership events.
- Providing information (news items, event details etc) for the website www.engineersaustralia.org.au/leadership
- Identifying potential leaders of the engineering teams from the past and present to profile during the year.





UNIVERSITY OF TASMANIA 2009 HONOURS PRIZE PRESENTATIONS



The Electrical Power Prize

Mr Stephen Clark of Transend Networks Ltd Pty (centre) presents Hoang Tran (left) and James Goodger (right) with the Electrical Power Prize for their project "Residential Scale Energy Services".

The Renewable Energy Prize

Mr Michael Hogan (Roaring 40s) presents the Renewable Energy Prize to Dean Gioso and Huw Boyd for their project "Optimising Fast Raise Response of Francis Turbines in Tail Water Depression Mode"

L-R: Alan Henderson, Dean Gioso, Michael Hogan, Huw Boyd



The Electronics and Computer Systems Engineering Prize

Mr David Smith of Rio Tinto Aluminium (right) presents Mehul Satikunvar (left) with the Electronics and Computer Systems Engineering Prize for his project "Microturbine control system"



The Edgar Haertel Civil Engineering Prize

Professor Chris Letchford (right) presents Tung Hoang (left) with The Edgar Haertel Civil Engineering Prize for his project "Woodstave Pipeline Analysis"

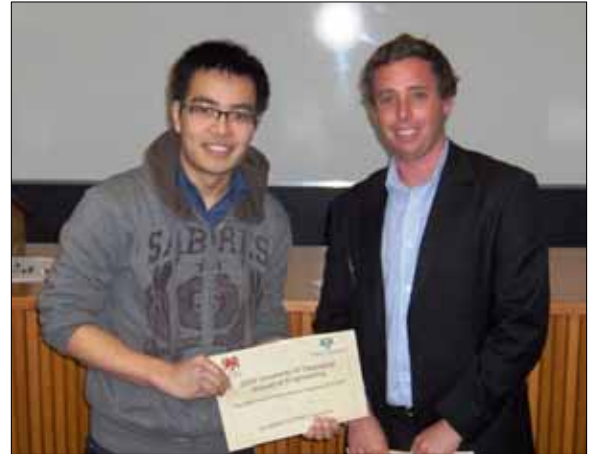


UNIVERSITY OF TASMANIA 2009 HONOURS PRIZE PRESENTATIONS



The Mechanical and Mechatronics Engineering Prize

Mr Patrick Burke (right) from Hydro Tasmania presents
Nam Do (left) with The Mechanical and Mechatronics
Engineering Prize for his project
"Identification of Wave Slam Events"

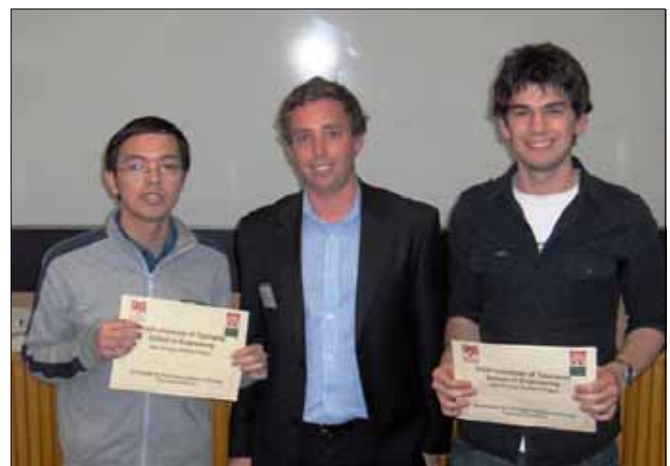


The Edmund Melerski Structural Mechanics Prize

Lyndon Johnson is presented with The Edmund
Melerski Structural Mechanics Prize by Mrs Eva
Melerski. The project was titled "Finite Element
Modelling of a Cobiax Concrete Slab"

Prize for Best Energy Related Project

Mr Patrick Burke from Hydro Tasmania (centre)
presents Hoang Tran (left) and James Goodger
(right) with the prize for Best Energy
Related Project



The Greenhigh Prize

Professor Chris Letchford (left) presents James
Goodger (right) with the School of Engineering
Greenhigh Prize



Nyssa Muir, GradIEAust

WOMEN IN ENGINEERING

Women in Engineering, Tasmania
Attract. Support. Develop. Celebrate.
Our mission is to increase the participation of women in the engineering profession and allow our member's aspirations to flourish.

Events

International Women's Day Breakfast Monday, 8 March 2010

Sure, it requires an early start. But what's not to like about bircher muesli and a good chin-wag? And champagne breakfast (depending on your respective company's alcohol policy!). Time & venue to be confirmed.

News

Updates from the Tasmanian WIE Committee

The WIE Tas Committee Roles for 2010 have been confirmed:

- Chair – Vanessa King, MIEAust
- Secretary – Fiona Evershed, MIEAust, CPEng
- Division & National WIE Rep – Amanda Halley, MIEAust
- School Visit Coordinator – Meredith McQueen, MIEAust
- Media Coordinator – Erin Driscoll, MIEAust
- Publications Coordinator – Nyssa Muir, GradIEAust
- General Member – Amanda Larsen

We welcome any new committee members and if you are interested in getting involved or have any queries, please email us.

“Thank You” to Amanda Halley

After two years at the helm, Amanda Halley has stepped down as Chair of Women in Engineering. Amanda did a great job as Chair, under difficult circumstances (small child, working part time, studying as well for some of it). Amanda's strengths included communication and inclusiveness - she places a high priority on making sure everyone knows what is going in and that no-one feels (or is!) left out.

On behalf of the Committee, we would like to thank Amanda deeply for all her hard work and many achievements. We are very pleased that she will continue to bring her skills & abilities to the Committee - with a particular focus on liaison between the WIE Committee and other EA groups in Tasmania.

“Thank You” to Vanessa King

Since Vanessa has taken up the role of Committee Chair, she has passed her newsletter responsibilities to me (Nyssa). On behalf of the WIE Committee and everyone who read her columns, we thank Vanessa for her time and creativity.

WIE Survey Results

We found that the majority of people wanted networking and technical events and would support a Facebook group. 50% of respondents listed 'Work Life Balance' as their most important WIE issue and 35% listed 'Equal Work for Equal Pay'.

Thank you to everyone who participated in our survey. The results will help us to better tailor our future events. There were some very passionate comments and we encourage those to join the committee to make a difference.

F1 Results

Please read the comprehensive report on pages 12 & 13 of this newsletter written by Neil Harris.

Reflection

Conclusions & New Beginnings

Welcome to a brand new year and a brand new decade. As you get back into the groove of work and 'make it happen' for 2010, we wish you the all the best.

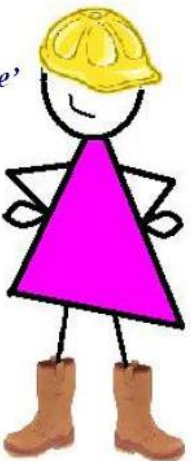
Summing up 2009 for the WIE;

- Schools & University Visitation programme
- F1 Schools event
- Social Events (IWD breakfast, networking

We hope that 2010 will bring another year of interesting events and cool networking opportunities.

WIE Articles

We don't have a million dollar publishing budget to produce a glossy WIE magazine but if we did maybe might look something like the draft below!



W.I.E.
WOMEN IN ENGINEERING

Values, supports and celebrates the contributions of women in the engineering team

Boosting your confidence
Defeating the 'imposter syndrome'

Getting contractors to talk to YOU

Don't forget to participate in Engineer Australia's 'Make It So' campaign

How to find PPE that actually FITS!

WIE around the globe
The world **IS** your oyster!

10 reasons why colleagues love your good communication skills!

If you have come across something or someone engineeringly (yes it's a word) nifty in your earthly travels or while surfing online (Wikipedia is a particularly fascinating & distracting medium), please contact us, so we may include it in this space.

FebFast

After the excesses of the festive season (I know I overdosed on fruit mince pies, but they *are* soooo good), here's a fundraiser that'll give you the good karma and a free detox at the same time. The catch? Stay off the booze for one month. Alcohol is actually listed as a poison and contributes to weight gain (sneakily so because it's in liquid form, and doesn't look much like cake...).

The money raised goes towards the Australian Drug Foundation. For more information see;
<http://www.febfast.com.au/>

Not only is it a good way of saving money, it will be a good social experiment. Alcohol is often present at many social gatherings and how we choose to use it determines many outcomes. Will not having a drink change your party experiences? Will your peers treat you differently? Have a go and find out.

Nyssa Muir, GradIEAust

WIE Committee Members:
Amanda Halley, Vanessa King, Meredith McQueen, Fiona Evershed, Erin Driscoll, Cassandra Blazely, Nyssa Muir and Amanda Larsen

Email: wietas@gmail.com
www.womeninengineering.com.au

WIE Tasmania is sponsored by GHD



CLIENTS | PEOPLE | PERFORMANCE

MAKE IT SO
MY CAR CAN FLY LIKE A PLANE

Make it so. With these three words we will show all Australians that the engineering team make things happen. The Make it so campaign aims to change the way Australians think and talk about engineering.

Visit <http://makeitso.org.au>, join our campaign, and Make it so.



It's your

CPD: understand it...
do it...
record it...

.....> visit www.engineersaustralia.org.au/cpd/



F1 IN SCHOOLS - REPORT FROM PORT DALRYMPLE SCHOOL



Three teams from Port Dalrymple School on the 7th of October arrived at the Tailrace Centre at 8:30 am, to face a competition day of 12 hours. Even with video footage, images of previous events and mock interviews to prepare them for the challenge; setting up with 25 other teams all intent on winning, meant that the initial hour was nerve racking. Due to travel restrictions, they had arrived later than other teams, who in some cases had half the previous day to setup for the event.



Team RubriX



Team Fastlane



Team Cyclones

However, with forward planning and a lot of lateral thinking, they were up and running within 10-15 minutes. The teams had organised their booths the day before, placing all relevant information on 1800 x 900 x 3 mm Corflute sheets, covered in dyed cotton material, the panel colour's matching their team designs. The teams were limited to four sheets per booth and as they found out on the day, very simple to install. The students were also aware of the ecological impact of using materials such as vinyl wrap around posters, for essentially a one off event. Therefore, every panel will be recycled for next year's competition and the laminated images placed on the panels, used for promotional events during 2010.



The competition opened with an introduction to the event from Mr Paul Bray, ReEngineering Australia's national manager along with video footage of this year's world titles. The vision and emotion emanating from this world class competition set the mood for friendly opposition from the start. The Cyclones started the competition for Port Dalrymple with time trials racing. This event requires all team members to attend the track for the three automated track races against another team.

Their times and other team's comments about the design of the car set the scene for some optimistic outcomes. The Cyclones times were the fastest for the next three time trial events. The day progressed and Port teams were making headway with Team RubriX and Team Fastlane setting new school records for the fastest cars and reaction times.



The level of competition and depth of talent from other schools was displayed in the line-up of vehicles and booth displays. The school and business community should be proud of the professional and determined approach that all teams took to the event. The teams did not come away with a 1st in either the apprentice or professional classes; however the outcomes at the end of the day for all Port Dalrymple teams were impressive.



Team “Fastlane” as Apprentice class competitors came away with three awards, in their own right very hard to achieve. These awards are based on a points system from engineering judges and the teams’ degree of interaction with industry technology.

Their awards were as follows: Apprentice Class Best Engineered Design, Apprentice Class Innovation award and Professional Class Best Engineered Design. This last award, is normally allocated for engineering design in both Junior and Senior Professional teams. Very good results, considering the economic and regional travel challenges faced by all three teams.

Team Cyclones and RubriX went from strength to strength during the competition indicating a bright future for their future involvement in F1 in schools.

All this would not have been possible without the support of the following sponsors, who through their commitment to the program enabled our students to take on and succeed with this demanding engineering and management challenge:

Mr Stephen Kernan from **SuperCharge Batteries**



Mr Tony Hewitt from **Louton Design**



Mr Kevin Ellis from **BOC Gas and Gear**



Mr Shane Gill from **BLH Engineering**



Through Women In Engineering providing support for the Port Dalrymple F1 in Schools teams, the organisation has assisted this program to develop and mature into an acknowledged challenge, that brings industry standards for engineering and management into the classroom.

So from the 2009 competitors, many thanks to Mrs Amanda Halley, from Team Cyclones, Team Fastlane and Team RubriX.

Neil Harris
Port Dalrymple School

YOUNG PROFESSIONALS NETWORK TASMANIA 2009 IN REVIEW

Thank you to everyone involved in the Young Professionals Network Tasmania (YPNT) during 2009.

2009 presented us with a fantastic year that saw a range of highly talked about events with a selection of amazing and intriguing guest speakers.

The year started with probably the most fun I've had at a networking event, with the trivia nights in Hobart and Launceston. Even just before Christmas someone commented to me on how much fun the trivia night was with comedian Wayne Dixon.

YPNT tackled topics such as The Economic Crisis and Climate Change & Sustainability.

The Economic Forum had presentations from Richard Dowling (TCCI), Barry Nielsen (Pitt & Sherry), Dr Paul Blacklow (UTas), David O'Halloran and Melissa Phelps (CRS).

The experiences and stories from the presenters captured the attention of Young Professionals and gave them practical advice on how to develop their skills and help see them through some of the toughest times of their careers.

Whilst the Forum on Climate Change and Sustainability saw a completely new format for YPNT events. The trial of the "panel" format was a huge success with YPs and speakers providing nothing but positive feedback.

Our panel of experts including Lochlan Gibson (GHD), Nick Flittner (Farmers & Graziers Union), Christine Materia (LGAT), Wendy Spencer (Climate Change Office) and Andrew Catchpole (Hydro) provided one of the most captivating and exciting discussions of the year.

Whilst YPNT will always continue to tackle hot topics, current affairs, provide professional development and career opportunities for Young Professionals, we cannot go past where the "real networking" is done.

The two End of Year events were highly successful and saw new opportunities and relationships for YPNT.

At the Northern event we partnered up with the newly formed Northern Young Professionals Network (NYPN) and went on a wine tour around the Tamar Valley.

I believe that in 2010 this relationship will be beneficial to both groups by the assistance of NYPNs momentum whilst helping YPNT continue to grow and develop in the North of Tasmania.

The Southern end of year can be summed up in one word... **"Wow"** It had an absolutely amazing turnout with approximately 130 guests from over 20 different organisations.

To go through all the positive feedback from the event would result in a large book being published, but here is one comment that I received; *"I have never been to a networking event before, I never really new what to expect. My friend asked me to come along and this is amazing. I've never met such a great range of people or this many, I'm definitely coming to many more. Thanks."*

2009 saw a change in the Committee with the sad departure of some passionate and enthusiastic people, however the people that have come forward to join the YPNT Committee and take this powerful group to great places are by far some of the most outgoing and forward thinking people I have ever met.

I have great confidence for what we will achieve in 2010, and I feel truly privileged to be a part of this team.

Finally, Thank you to the Committee, our wonderful sponsors and the amazing team at Engineers Australia, the combined efforts of all these people will continue to see YPNT prosper into the future.

We hope to see you at one of our upcoming events during 2010.

Richard Moffat
Chair, YPNT

CONGRATULATIONS/ WELCOME

Members joining, rejoining
or upgrading

MEMBERS

Neil Bose, MIEAust CPEng
Liam Dingemane, MIEAust
Daniel Gardner, MIEAust
Rebecca Godfrey, MIEAust
Ridsen Knightley, MIEAust
Suraj Neupane, MIEAust
David Pollington, MIEAust
Jane Sargison, MIEAust
Bryce Taplin, MIEAust CPEng
Ponnai Umopathy, MIEAust
Venkat Velma, MIEAust
Luke Whitehouse, MIEAust
Simon Witt, OMIEAust

GRADUATES

Craig Anderson, GradIEAust
Rebecca Dunn, GradIEAust
Xin Huang, GradIEAust
Christopher Linton, GradIEAust
Trung Nguyen, GradIEAust
Joel Thorby, GradIEAust
Mark White, GradIEAust
Jason Wong, GradIEAust

STUDENTS

(StudIEAust)

Mohammed Abdullah
Erica Davey
Ee Hoe
Ti Koh
Jia Lin
Kynan Onions

MAKE IT SO
I CAN MAKE MY OWN REAL
BIKE OR CAR WITH BLOCKS

Make it so, grab these three words and
watch all Australians that the engineering team
make things happen. The Make it so campaign
aims to change the way Australians think and
talk about engineering.

Start **Make it so** by joining our campaign,
and Make it so.



NORTH WEST GROUP: 2009 IN REVIEW

2009 saw the North West Group have another calendar year full of events, with a combination of site visits and a number of dinner meetings. Below is an outline of the meetings/activities held:

February

Our first event was the Annual General Meeting which was held in February. Number in attendance: 23. The following positions filled:

Chair: Andy Opanowycz, MIEAust CPEng
Secretary: Vere Cooper, MIEAust CPEng
Treasurer: Andrew Boyd, GradOIEAust
Committee: Simon Heung, MIEAust
Gary Neil, MIEAust
Chris Martin, MIEAust CPEng

March

At our first Committee meeting we decided to hold a family day in March while the weather was still warm and sunny. This timed in rather well with Steamfest which Chris Martin is also a chief organiser of. The day included plenty of free time to view the displays and activities, and then followed by a BBQ. Number in attendance: 19

March also saw a joint North West Group and Young Engineers meeting at the Burnie Polytechnic Campus. The night began with some general networking over pizza and softdrink, which was then followed by a terrific presentation by Aaron Brimfield, MIEAust CPEng an Operations Manager with VEC Civil Engineering. Number in attendance: 20

April

Saturday 18 & Sunday 19 – Heritage Tour on the West Coast. Number in attendance: 25

May

“The 1912 Mount Lyell Disaster, the Official Story Debunked” Presented by Peter Schulze at the Ulverstone Civic Centre. Number in Attendance: 26

June

“Geotechnical Engineering Lessons Learnt on Infrastructure Projects in Hong Kong”. Presented by Tony Barierra at the Ulverstone Band Rooms. Number in attendance: 16

July

SCIENCE & ENGINEERING CHALLENGE – This was supported by a number of our members on the day in Burnie at Marist College.

August

“Engineering challenges in design and construction of maintenance free industrial and mining structures”. Presented by Slawek Misiun. Number in attendance: 18

September

An enlightening presentation by the guys from HELLA Australia detailing human optics and a range of lighting products. Presented by Urbain du Plessis and Darren Ward at the Top Pub in Wynyard. This was also a joint NW Group/YEAT event. Number in attendance: 19

The National President also visited us in Devonport. Thank you to Peter for spending the time with the group and talking with our members before and after his presentation. Number in attendance: 19



Peter Godfrey (2009 National President) with North West Group Members during his visit

October

“Engineering Experiences from the Middle East to Australia”. Presented by Ridsen Knightly (Kentish Council General Manager & Engineer) at the Ulverstone Band Rooms. Number in attendance: 15

November

Alan Burn Memorial Lecture: “Engineers have Hearts as well as Heads”. Presented by Bill Lawson (AM, FIEAust, CPEng), Principal, Sinclair Knight Merz. Number in attendance: 32

December

Our final event for the year was our Christmas Dinner which was held at Ulverstone’s Pedro’s Restaurant.

Our first event for 2010 is the Annual General Meeting to be held on Wednesday, 10 February in the Ulverstone Civic Centre. Our guest speaker will be Mike Paine (Chief Executive Officer of Southern Water) who will give a presentation titled “Cradle Mountain Water – the First 100 Days”. For further information, please refer to the advertising flyer on page 20 of this newsletter

Many thanks to the North West Group Committee for the work they have put in and for organising some very interesting presentations and of course to the members who supported these events by attending. Thank you also to Geoff and Catherine for their fantastic assistance during the year.

Andrew Boyd, GradOIEAust

HERITAGE PAGES

3rd Australasian Engineering Heritage Conference

Engineering in the Development of a Region – Heritage and History SALMOND COLLEGE, UNIVERSITY OF OTAGO, DUNEDIN, NEW ZEALAND 22 – 25 NOVEMBER 2009

Papers ranged from exploring the future of personal mobile and global positioning system devices for advocacy and education in heritage engineering, to engineers in history and the importance of archives. Other topics covered the management and use of historic sites and industrial landscapes including the monitoring, analysis and management of historic structures; timber milling and gold mining; construction of the Waitaki and Manapouri Hydro-electric power stations; irrigation schemes and dams; and railways.

Conference Themes and Topics included:

- Agricultural Development (irrigation & drainage, flood protection, refrigeration engineering, process industries, machinery, sawmilling, buildings)
- Power (hydro-electric, wind; steam, diesel, gas)
- Transport and Communications (roading, bridges, railways, shipping and shipbuilding, harbours and ports)
- Resource Extraction (Gold – mining, sluicing, dredging, tunneling, smelting, coal, scheelite, oil shale)
- The People (entrepreneurs, communities, businesses, manufacturers, engineers; innovators)

The panel included Keynote speakers with a wide range of interests and expertise to initiate presentations and discussions:

Sir Neil Cossons (UK), industrial archaeologist and former Chairman of English Heritage;

Paul Davies (Australia), heritage management consultant;

David Dolan (Australia), Professor of Cultural Heritage at Curtin University;

Wayne Johnson (Australia), Sydney Harbour Foreshore archaeologist;

Euan McQueen (NZ), geographer and NZ railway heritage historian;

Robert McWilliam (UK), editor for vol.3 of ICE Biographical Dictionary of Civil Engineers;

Duncan Waterson (Australia), historian – settlers, agriculture, railways, politics et al.

At the conclusion of the conference, the National Board of Engineering Heritage Australia held their bi-annual meeting. The Board saw a prototype of the new National Landmark Marker.



EHA National Board Dunedin, November 2009

*Back row (l-r) Don Young (WA),
Andrew Barnes (Qld), Ben Johnston (Tas, YEAT),
David Beauchamp (Vic), Richard Venus (SA),
Bill Jordan (Newcastle), Bruce Cole (Tas),
Lyndon Tilbrook (Canberra),
Rod Caldwell (Newcastle)*

*Seated (l-r) Keith Baker (Canberra),
John Heathers (Sydney), Owen Peake (Vic),
Helen Slat (Administrator, National Office)*

*Owen Peake is National Chair
John Heathers is Deputy Chair
Keith Baker is Immediate Past Chair*

*Owen Peake is holding the new Marker for
Engineering Heritage National Landmarks.*

HERITAGE PAGES

AWARD OF MERIT FOR PETER SPRATT, FIEAust CPEng

10 November 2009



Engineering Heritage Australia makes several Awards of Merit each year to people who have made notable contribution to the cause of engineering heritage, through one or more of the following activities:

- raising awareness of engineering heritage within the profession and/or the community;
 - promotion of engineering heritage conservation within the profession and/or the community;
 - recording and documenting engineering heritage works;
- activity related to the conservation of works of engineering heritage;
 - such other contributions to the cause of engineering heritage conservation considered by EHA worthy of recognition.

In Peter Spratt's case:

- He has practised as a heritage and conservation engineer for 30 years.
- Through research and testing, he developed conservation measures to counteract the massive disintegration of historic buildings at Port Arthur. This involved methods of inserting damp courses, refiring bricks and finding sources of montmorillonite-free sandstone.
- He has applied this knowledge to other historic buildings in Tasmania and elsewhere.
- He devised and organised the restoration of the 13 m high Raine Island Beacon, built in 1844 on a tiny island off the North Queensland coast which marks a channel through the Great Barrier Reef for which he received an Engineering Excellence Award.
- Peter's detailed knowledge of the construction and defects of the Royal Engineers Building was instrumental in achieving a successful restoration in 1986.
- Peter was a member of the Tasmanian Heritage Council from its inception in 1997 and served three terms. His knowledge of all the good and bad sandstone sources in Tasmania has been invaluable. He has worked on conservation issues relating to the Richmond Bridge (1825), Ross Bridge (1836) and the Bridgewater Bridge (1947).

Peter already has one Award of Merit, the inaugural Tasmania Division Award of Merit presented in 1983. He becomes the fourth person in Tasmania to receive a National Heritage Award of Merit which consists of a certificate and citation framed together. Well done Peter !!

Bruce Cole, FIEAust CPEng (Ret)
Chair, Engineering Heritage Tasmania

Site Tour of Norske Skog Boyer Mill

On Tuesday, 8 December 11 people attended a tour of the Norske Skog Boyer Mill to inspect the new Wood Mill and new TMP3 plant.

Norske Skog has installed a new wood mill for pine logs and a new Thermo Mechanical Pulping (TMP) Plant, TMP3 at a combined cost of around \$50 million. This allows Norske Skog Boyer to be fed entirely with pine chips.

The wood mill part of the tour was perhaps the most interesting, it was more visual, and the entire process except for the final conveying of the chips can be viewed.



This photo shows the woodmill during the construction phase

It is quite spectacular with the logs being loaded into the hopper, being sorted and then going through the chipper one by one in a very short time. The chips are then screened and go to a stacker reclaimer before being fed to the TMP plants.

There are quite a few interesting technical features in the wood mill:

- The design and construction process, where a full 3D CAD (computer aided design) process was used, with the various parts being fabricated off-site in different countries and then brought together on site and assembled. Except for a couple of minor problems there were no mismatches.
- The chipper has two motors feeding into a common gearbox and angled to maximise energy efficiency. We observed the razor sharp blades ready for blade changes.
- The one operator of the wood mill has an HMI (human machine interface) for the PLC control system and comprehensive high resolution video surveillance of

the plant. The control of the surge bin was successfully altered on site as the designed scheme was not reliable.

- The chip conveyors are air supported belt conveyors which are fully enclosed. These conveyors were new to most of the attendees, with some wondering whether they were pneumatic conveyors.
- The stacker reclaimer is circular with the chips being fed from a fixed point to form a cone, with the chips being withdrawn from the bottom.
- The TMP3 plant is impressive particularly for its scale, the primary refiner is driven by two 12MW synchronous motors, and there are other refiners in the plant also driven by large although smaller synchronous motors. Norske Skog Boyer has the largest installation of synchronous motors in the state by a considerable margin.



The primary refiner being lowered onto its massive foundation

- The TMP3 plant has been engineered into an existing building designed for quite a different process and except for the obvious age of the building this is not apparent. This is an impressive feat and must have posed huge layout challenges for the designers.
- The TMP3 plant is highly automated; it has its own control room and has been integrated into the plant wide control system.

The tour party was split into two groups and led by Greg Ludford and Chris Beanlands. Engineers Australia thanks Norske Skog for allowing this tour and especially Chris Beanlands and Greg Ludford for their excellent and informative tour guiding.

Graham Shepherd, MIEAust CPEng

Site Tour of MONA (Museum of Old and New Art)

On Monday, 23 November around 40 people attended a tour of MONA (Museum of Old and New Art) and then enjoyed a cocktail party to celebrate Christmas in the adjacent Ether Building Function Centre.



Numbers for the tour were restricted to ensure the safety of visitors as the site is very much still in the construction phase. Matt Cadle and Allan Wood representing Hansen Yuncken Pty Ltd acted as tour guides for two groups and answered many questions about the unique project.

Matt is the senior project manager and has been working on the project from the beginning of excavation works, in early 2007, and will clock up more than three years on the project before work finishes around mid 2010. There was widespread acknowledgment of the unusual nature of the project, with most vowing to return to appreciate the finished building and the artworks it will house.

While the project has many interesting and unusual features, some of the more noteworthy are:

- The underpinning of the original (heritage listed) Moorilla Museum, which forms the entry point to MONA via a glass elevator, or circular staircase, involved a 6m diameter 14m deep excavation in solid sandstone;
- Excavation of over 35,000m³ of sandstone, with a major feature being the sawn rock surface exposed throughout much of the building;
- The use of waffles to both the precast façade and also the soffits of roof slabs;
- “Floating” art display walls which allow future flexibility to suit varying displays and also are an integral component of the mechanical ventilation systems;
- Ongoing design changes throughout the project where, for example, the building layout was changed to suit newly acquired art works, and the Nolan Gallery, which will feature a multi-paneled Sidney Nolan artwork called “Snake” to be hung along a curved wall enabling viewers to see all of it from the one location;
- Naturally, the building services required for the museum are top of the range, with duplicate systems providing redundancy for both air conditioning and power supply. To enable valuable art works from national and international travelling exhibitions to be featured requires the

highest levels of security and climate control. The loading dock features insulated doors and mechanical systems that bring the space to the required conditions before the truck is opened and the artworks removed;

- Internal finishes are typically “honest” with structural steel and concrete elements often exposed directly; this has required much attention to detail from the builders and subcontractors;



An impressive steel staircase within the complex

- The logistics of installing sections of the building, such as steel staircases and the beam that supports the pedestrian bridge from beneath the original Moorilla Museum into MONA, required thorough planning and innovative methods from the builder. Crane access is possible in some areas only, requiring trolley systems and temporary gantry cranes, which used the beams within the main structure for support;
- The major plant room has now become an “exhibit/gallery” in itself, so that people can see inside the plant room from a “cage” that keeps them away from hazards (or controls) but allows them to appreciate what is involved in the back-of-house areas;
- Project quantities are still evolving, but include 6,000m³ concrete, 10km of electrical sub mains cable, 70km of optic fibre cabling, and 2.5km of lighting track.

This is a major project in the international context, and to see it being developed in Tasmania is remarkable. The project has required a collaborative relationship between all those involved in the project, including: the client MONA (David Walsh); builder Hansen Yuncken; Fender Katsalidis Architects; Fellicetti structural engineers; WSP Lincolne Scott services engineers; Coffey geotechnical engineers; and Johnstone McGee & Gandy civil engineers.

**Grant Atherton,
FIEAust CPEng**



CALENDAR 2010

For up to date information on these and other events, please visit www.engineersaustralia.org.au/tasevents

FEBRUARY

Wednesday 10 - North West Group - ANNUAL GENERAL MEETING & Dinner - "Cradle Mountain Water - The First 100 Days" - Mike Paine, FIEAust CPEng (CEO, Southern Water) - 6.00 for 6.30pm - Ulverstone Civic Centre - \$15 Members or \$20 Non Members - RSVP by 4 February to Vere Cooper 6498 7920 or vere.cooper@cmwater.com.au (Refer to this page)

Thursday 11 - UTAS School of Mathematics & Physics - Creating a Radio Telescope the Diameter of the Earth - Alan R Whitney (MIT Haystack Observatory) - 8.00pm - Physics Lecture Theatre 1, Sandy Bay Campus - All Welcome

Wednesday 17 - CELM/Young Engineers - ENGINEERING LEADERSHIP BREAKFAST - "Be the Change" - 7.45am to 9.00am (arrivals from 7.30am) - Mawson's Waterside Pavilion, Hobart - **FREE to members of Engineering related professions** - RSVP by Wednesday, 10 February to Catherine Reading 6234 2228 or creading@engineersaustralia.org.au (Refer to page 7)

Tuesday 23 - BEDP - Practical BIM: Now and In the Future - 3.00pm to 7.00pm (followed by drinks & networking) - Henry Jones Art House Hotel, Hobart - Cost \$110 per person - Refer to online registration form at: www.engineersaustralia.org.au/tasevents

Engineers Australia is drafting a new Royal Charter and Bye-laws and new Code of Ethics.

The Tasmania Division Committee has formed a Sub-Committee to co-ordinate the Division's response to these drafts.

Any member who is interested in joining the Committee please contact Catherine Reading at the Division Office on 6234 2228 or creading@engineersaustralia.org.au

NORTH WEST GROUP

ANNUAL GENERAL MEETING & DINNER

DATE: Wednesday, 10 February 2010

TIME: 6.00 for 6.30pm

PLACE: Ulverstone Civic Centre

MIKE PAINE, FIEAust CPEng

Chief Executive Officer, Southern Water
(former CEO of Cradle Mountain Water)

Mike was the Chief Executive Officer of Cradle Mountain Water for a year during 2009-10 and transferred to Southern Water, as Chief Executive Officer, on 18 January 2010.

He will give a presentation on the first 100 days of Cradle Mountain Water (CMW) and also provide an overview of the water and sewerage achievements of CMW during 2009, plus provide an insight into the world of Southern Water.

"CRADLE MOUNTAIN WATER – THE FIRST 100 DAYS"

COST: Members \$15.00
Non Members \$20.00

RSVP: Vere Cooper by
Thursday, 4 February 2010
6498 7920 or
vere.cooper@cmwater.com.au

**THIS MEETING WARRANTS
1.5 HOURS CPD**