NB
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Australian Branch

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Institution of MECHANICAL ENGINEERS

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PERFORMANCE AT THE LIMIT

Metro trains new training programme "Performance at the limit", sees Formula 1 money-raiser Richard West bring the high pace world of Formula 1 into the training room. In May, IMechE Victoria members were given the opportunity to have a taster of life in the fast lane with an immersion into the world of the pit crew.

Performance at the limit is the brainchild of Richard West and has been brought in to Metro trains as a workplace training and development exercise. The backbone of the training is a pit stop tyre change on a real life Jordan Honda 198, one of the cars used by the Jordan Team in the 1998 F1 season. It was the spare car used on the track by the 1996 World Drivers Champion; Damon Hill and his team mate Ralf Schumacher, during the season in which Hill scored Jordan's historic first victory at the 1998 Belgian Grand Prix.

Formula 1 is a business and one of the most demanding fields around. Being able to successfully manage and lead a Formula 1 team provides a lot of lessons which can be transferred to commercial industry. Performance at the limit takes the principles of Formula 1 and applies them to industry.

Richard West was a key figure for Williams, McLaren and Arrows racing teams and worked closely with Grand Prix greats such as Niki Lauda, Alain Prost, Ayrton Senna and Michael Schumacher. Richard started proceedings by giving a brief talk about the programme principles and key aspects of driving and dealing with change. In order to keep on moving forwards, strong leadership is important, but shared leadership is vital. It is impossible for one person to run a company alone without the aid of others and empowering those around you and enabling them to take the lead is key to progressing. In order to allow shared leadership, collaborative decision making is required.

Jordan Honda 198 Formula 1 car used for the pit stop challenge.

Richard then went on to talk about change, the only constant in this world today. We have to embrace change and understand how to change as well as enable others around us to change in order to thrive. If you are not moving forwards in Formula 1, as with industry, you are moving backwards. Inability to embrace change will limit future performance.

ON THE INSIDE

Richard West and pit chief.

F1 teams can get the wheels on a current car change in less than 2 seconds. It is only through repetitive training that this is achieved – something we did not have.

Once the teams got to work it was clear that we would not be touching the 2 second mark. The brief practice sessions quickly made the process slicker, but mistakes were common. As with business, post-race reviews are vital to eliminate mistakes and learn and improve. Delegation of responsibility worked better for some team than others, and identifying the weak spots in the process led the winning team to post a time of less than 11 seconds – not bad for just 15 minutes of practice. The latest times of less than 2 seconds have been achieved through advances in technology including a change to the wheel nut design as well as an optimisation of the tools. It looks like the IMechE members have a little way to go.

Richard's enthusiasm was contagious and soon the room was hyped up to take on the practical part of the evening – a tyre change on a the Jordan formula 1 car against the clock. Moving to the main practical room, the centrepiece of the room, the F1 car, still gleams and shines covered in advertising logos as we've seen so many times on TV.

After a quick briefing we were split into teams and left to delegate the various responsibilities to the team. Each wheel requires a team of 3; the tyre remover, the gunman and the replacer. It is vital that these three work in harmony to achieve a quick change.

Matt Proudlock / Brian Carter
Ass. Hon Sec. / Vic panel member

IMechE members getting involved in the pit stop.

PROFESSIONAL ENGINEERING APP

The Institution's new Professional Engineering (PE) app allows members to keep abreast of industry news on their mobile and tablet devices.

The app allows members to access the latest engineering and Institution news as soon as it's published. The fully interactive app includes regular PE online content and features, as well as exclusive global news

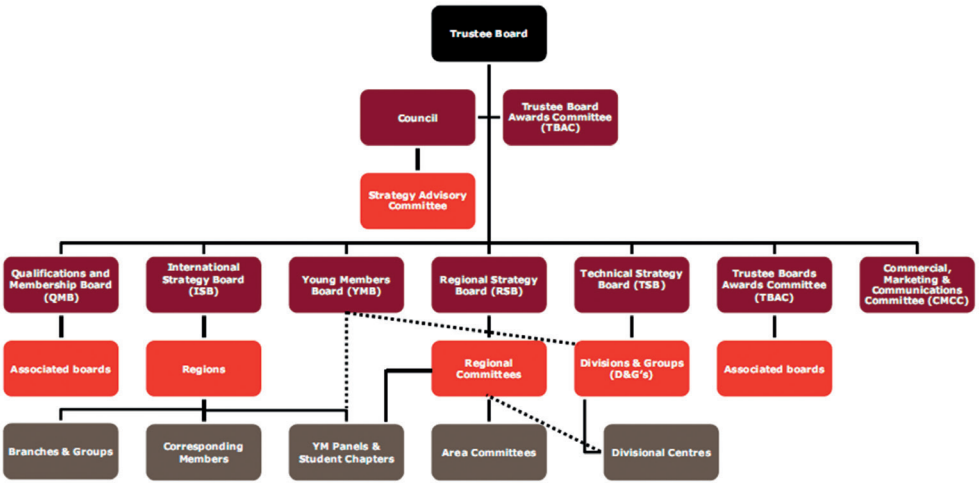
The Institution's Marketing Operations Director, James Hobbs, said: "Along with the recent redesign of PE content on the Institution's website, the next logical step was to introduce an app that allows our members to access PE's content on all devices. The Institution's membership is diversifying and this new service is here to support members at all grades, including students and apprentices."

Not only does the app offer a more convenient and immediate way for readers to consume PE content, it also represents an exciting new service for the Institution's 20,000 international members who can now all benefit from the expert engineering insights provided by the PE editorial team every month. James said: "International members constitute a growing proportion of our membership base, so we are pleased to announce this exciting new service for all our members."

Members can download the app onto their mobile, tablet and desktop devices, and it is compatible with all platforms, including Apple and Android. Two editions of the app – UK and Global – are available to suit members' locations and preferences, and can be switched at any time.
Find out more about the app and how to download it by visiting www.imeche.org/peapp.

YOUNG MEMBER BOARD STRATEGY WEEKEND

August 14th 2015 saw 36 delegates from across the globe come together for the annual strategy weekend of the Young Member Board (YMB). Amy Lezala attended as the Oceania Representative in order to provide feedback on our experience here in the Antipodes.



Young Members organisation chart

There were some common themes throughout the weekend and many passionate discussions. The Chair, Peter Bonnington's message to us all that this is our Institution which we will be leading in 20 years' time so, what do we want to be leading? It is time to start shaping the face of our Institution now in order to make it ours. In summary, the weekend showed that we need to focus on a global view of the IMechE with accessibility for all and to diversify rather than target. Also, to improve the image of engineering and provide a clear voice across the Institutions to address the conversion rate of students into industry.

This was the second strategy weekend with the full international presence and it made a positive impact as it became clear that the remoteness of Scotland is equivalent to the remoteness of South East Asia in relation to accessing London. It became evident that we need to make all of our workings accessible in order for equal value of membership to be gained by all, whether stationed on a rig, living in the Americas, or working in central London.

The IMechE is aiming for 50% international membership by the year 2020. In order to achieve that target we need to maintain a consistent focus towards enabling and supporting our international members. Each topic over the weekend was addressed with a global view, something which made the team generate different (and more creative) solutions.

A provocative topic over the duration of the weekend was that of women in engineering; something which struck very emotive responses in the team. It was agreed that positive discrimination is not productive and that the IMechE should be leading the way with regards to diversification in the industry, rather than target individual demographics.

When looking to the industry, we were all in agreement that the common solution to address the skills shortage, the gender gap and protecting the title 'Engineer' is through improving image awareness of Engineers. By increasing awareness of what our career entails, not limiting it to the traditional automotive and aeronautical, then we will attract a broader demographic. There were many creative and exciting ideas presented to complete this, including an Engineering drama series (far-fetched but effective!), so watch this space. If you have any ideas please feel free to send them into the YMB.

The YMB recognise that the reason there may be an unclear image of what engineering includes is because we, as an industry, have not been working together to provide a consistent image. An outcome of the weekend is that we are proposing a 'voice of engineering' be presented by collaborating with the other Institutions in order to have a clear advice on key issues. This is something the IET and ICE representatives supported and it will be put forward to the Trustee Board. The structure of the engineering community requires that we pass this through various stakeholders before it becomes a reality so please have patience but, also, make your support known.

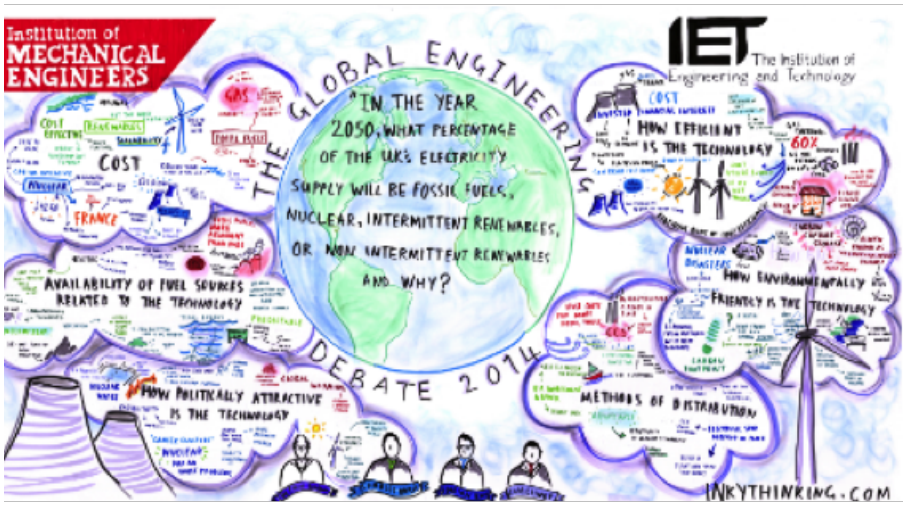
The 'State of the Profession' paper from Stephen Tetlow, IMechE CEO, was presented at the YMB Strategy weekend and discussed in length. It is clear that we should start focusing more energy on converting those taking on engineering courses into professional engineers. Focusing on primary education pupils is fruitful for raising awareness of the profession; however, in the UK, for every 100 boys at primary level we are only retaining 1.6 engineers. This number drops to 0.2 engineers for every 100 girls in primary education.

The drop appears to be at the university level and at the point of entering industry. It is well known that many engineering graduates choose to leave for other, more financially lucrative, industries. We need to start making the profession more attractive by celebrating the qualitative rewards. As the saying goes, "maintaining the world of today whilst shaping the world of tomorrow".

More information and comment from Stephen Tetlow on the engineering profession can be found in his response to the Engineering UK report at http://www.imeche.org/news/institution/institution-responds-to-latest-engineeringuk-report

The weekend was long but very productive. If you would like to know more, or have any comments, please feel free to contact myself or any other YMB representative.

Amy Lezala
Young Member Chair



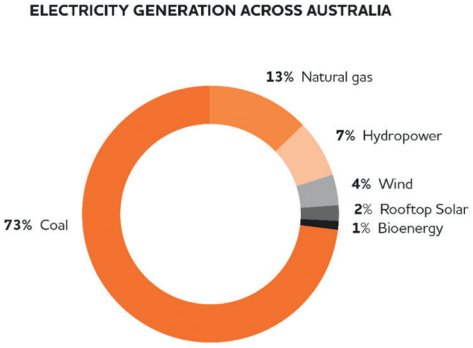
GLOBAL ENGINEERING DEBATE

The Global Engineering Debate (GED) is an initiative created and administered by the Young Members of the Institution of Mechanical Engineers from across the world. Its purpose is to create a platform where young engineers around the globe can debate the key issues that affect the current and future generations of engineering professionals.

In 2015 the GED was launched at the Institution of Mechanical Engineers' HQ in Westminster, and further events have taken place in Hong Kong and across the globe. The Australian event is scheduled for Thursday 15th October and will take place in Lecture Theatre A1 in the Old Engineering Building at the University of Melbourne from 18:30.

Each year the GED sets a different theme and this year the theme is Energy. The question for debate is "Which of the following energy sources should Australia invest the majority of its resources in between now and 2050?". Each speaker will be a young engineering professional with sufficient experience in their field, and will argue in favour of the source of energy which they are representing. A vote will be taken before and after the debate to assess people's opinions and how they have been shifted by the discussion. In the London launch event there was a significant shift in voting after the debate away from nuclear and towards renewable sources of energy. So join us in October to have your say about Australia's energy future (further details and registration link to be circulated via e-mail soon) or by following the QR code below."

Khalid Abdulla
Victorian YM rep

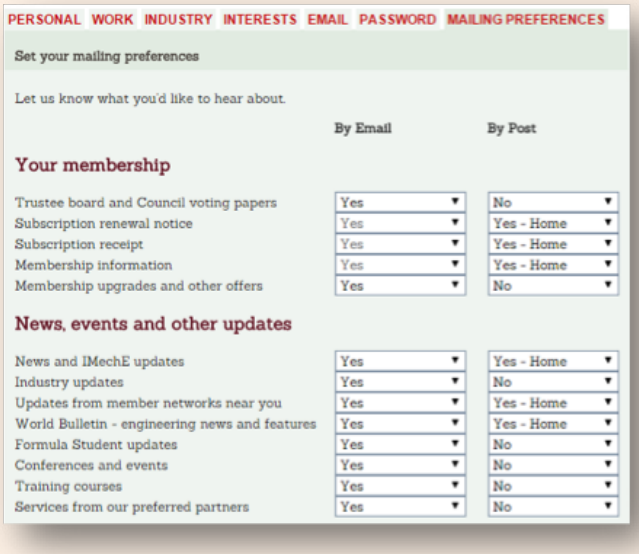


Energy generation across Australia.

CONTACT PREFERENCES.

The IMeche have updated their mailing and account subscription settings according to your account settings on the IMechE website. To ensure you are getting the content you want in the format you would like, log in to the IMechE website now and ensure your preferences are correct. To do this, go to www.IMechE.org and click on the "Your Account" symbol. Once you have logged in, choose "My profile" on the left side and "mailing preferences" in the main screen.

While you are there take your time to check out the Virtual Library and the IMechE's new integrated knowledge platform "On Demand" and their new elearning courses and qualifications.



FROM THE CHAIR

As I write my first article in the News Bulletin as Branch Chair, I must first thank my predecessor for his assistance and encouragement as I acted as Hon. Secretary in preparation for this role.

The IMechE has now surpassed its target of 100,000 members and had welcomed its 106,000th member. The IMechE is also the fastest growing UK professional engineering institution. While the majority of the Institution's Members reside in the UK, I feel that the Australian Branch has been able to contribute to those numbers as well. This is evidenced by the increasing numbers of professional review interviews which have been conducted over the past few years and the increasing number of participants at the Speak out for Engineering competitions being conducted in the various states around Australia.

One of the things I would like to achieve during my two years as Branch Chair is to improve the visibility and relevance of the Institution in Australia. By that, I mean that potential engineering candidates will view membership of the IMechE and registration as a CEng as beneficial and a worthwhile goal. The Branch will also need to work closely with, and in some instances improve its relationship with, Engineers Australia and be viewed as a partner rather than a competitor. Another way of improving visibility is for the Institution to be approved as an assessor for the Registered Professional Engineer of Queensland qualification. This is presently being progressed and I will provide updates as and when there is something to report.

Early this year, the SOFE final held prior to the AGM welcomed its first contestant from New Zealand. This made the competition the first Oceania Region SOFE competition to be held as part of the Annual Branch face to face Committee Meeting and AGM. We look forwards to welcoming a competitor from PNG into a future regional final.

Although it is pleasing to see rising numbers of those presenting themselves for professional review interviews, we must, as a group, make the Branch relevant to the younger members too as they will be the future of the Institution. Speaking of Young Members, is there anyone out there who is enthusiastic and has the ability and time to spread the word about the good things the Branch does via Social Media (FB, Twitter, etc.)? The Branch requires someone to perform two functions;

- Branch IT Coordinator
- Social Media guru

These positions could be performed either by the same person or separate people if they have the capabilities and the time. Please contact me if you are interested in volunteering for these positions.

The success of the Branch is largely determined by the membership. As the Branch is made up of volunteers, I encourage all of you to participate and share your experience so that we may make the Branch a vibrant and exciting place to be. There are many ways to get involved. For example;

- Join your local Panel
- Organise an event (technical presentations, annual dinners…)
- Become an assessor for Professional Review Interviews
- Make a presentation at a local school or University
- Participate in an event (e.g.. SOfE)

What you get out of it, is what you are prepared to put in to the Branch. I look forward to your involvement.

Leslie Yeow
AustraliaChair@imechenetwork.org

Erin Kwon receiving her Speak Out for Engineering prize.

Flying machine's bike frame geometry with 3D printed lugs.

EDITORIAL

I was lucky enough to attend the Victorian panel's Christmas in July function. The talk about CSIRO's titanium 3D printing was enthralling, but the take away message for me was the principle that CSIRO had applied to making a high capital investment technology available to the masses. CSIRO spent millions of dollars on Lab 22, to purchase state of the art printing technologies purely to enable other groups to be able to utilise them. CSIRO will design, optimise and produce titanium printed parts at cost price for small businesses. From biomedical implants to shark tagging hooks, CSIRO have helped entrepreneurs compete with the big boys by offering them access to technologies outside of their normal reach. One of the best synergies of traditional and modern I have recently seen was the use of their printers to build the lugs (joining components such as stem, bottom bracket etc.) for a bike at individual geometries. These can then be joined

together with standard titanium tube to produce a bike of any geometry feasible, tailored to the individual's requirements. CSIRO even helped to develop a program which turns the required frame geometry into the lug design, allowing the designers to just choose the frame dimensions and send off for printing. It is great to see the Australian government investing in small business in this way, allowing them to succeed on their own merit.

Matt Proudlock
News Bulletin Editor
AustraliaNews@imechenetwork.org

YOUNG MEMBER NEWS

Topics of the Quarter:

- EngTravaganza:13th March 2016, Hobart
- Global Engineering Debate: 15th October 2015, University of Melbourne
- Design Competition: Quarter 4 2015
- Photography Competition: Quarter 4 2015
- Business Development Manager (BDM) Support
- Independent Mentoring Scheme (IMS)
- Local Independent Mentor Event

As many of you may have seen, I have now taken on the role of Oceania YM Chair. Firstly, I would like to thank Belinda Herden for all of her work in establishing this network in our region so that my role is extending what is there, rather than establishing.

It is with great excitement and a little sadness that I inform you of my new role as it means I will be stepping down as the Australia YM Chair. After three years it is time to hand over and provide the chance for fresh ideas. It has been a fun time where we have achieved so much, thanks to the efforts of your local YM Reps.

Not only do we now have a strong presence in NSW, WA and VIC, we are active as a national group. Each year we have held the EngTravaganza and it continues to be a key event at the Australian AGM. The next will be held March 13th 2016 in Hobart. If you have any recommendations for our engineering tour that day, please contact myself or your local YM Rep.

In addition to this we are now present at many international meetings and are making the IMechE aware of how much activity we have in Australia. We feed back to the Young Member Board, the International Strategy Board and we have representation on Council. All of this is making it possible to provide increased engagement for yourselves by demonstrating that international regions can be successful with the right support.

In response to this, along with the voice of our non-UK colleagues, the IMechE is providing more international and remote events that are accessible to all. In October there will be the Australian leg of the Global Engineering Debate, to be held at the University of Melbourne, along with an online photography competition in Quarter 4 of 2015. We are also looking to support the Asian Design Competition which needs support from YM in Australia. If you are interested in any of these events, please contact the following representatives for more details. I will add that there are prizes for each event!

- Global Engineering Debate, October 2015 – Khalid Abdulla, VIC YM Rep
- Design Competition, Q4 2015 – Kally Baxter, WA
- Photography Competition, Q4 2015 – Siddartha Khastgir, Southern Asia YM

In networking with our international colleagues we have also learned that there are services available which Australia is not using to the full extent. Namely, the Business Development Managers (BDMs). There is a service available to all members for supporting you through your application; either the traditional route or MPDS. The BDMs will review your application and ensure it is ready, as well as supporting you through the interview process.
The team also provide a service of establishing partnerships with local organisations. If this is something you think your employer would be interested in, please feel free to contact myself or the BDM team.
As part of the application process it is recommended to seek a Mentor to guide you in your career, provide help in becoming professionally registered, and offer impartial advice. Through our presence on the various Boards we have encouraged the development of the Independent Mentoring Scheme. This is an international matching service for Mentors and Mentees.
The Vic YMs recognise that Independent Mentoring is important and is needed locally in Australia where MPDS schemes are rare.
The VIC YMs hosted an extremely successful event, facilitating the meeting of potential mentors and mentees in Melbourne. Individuals attended the session where the groups had three 20 minute 1:1 sessions and an informal group meet and greet after. It was well attended and fruitful for the VIC panel and thanks go to Khalid and his team for taking the initiative to organise this. If you would like to see more of these events please contact your local YM Rep.
This will be my last News Letter as Australia YM Chair. Thank you so much for your encouragement and time over the last three years. The new chair will be announced in the coming weeks. Please continue to support them and keep this network alive. It's been a blast!

AMY LEZALA
Young Member Chair

OCEANIA NEWS

Ever had that nagging feeling that you aren't getting any younger?
That's not the start of a depressing talk back radio feature – but rather the overwhelming sensation I had when I stood up to address a group of undergraduates in NSW recently. For a start, some of the audience were not born when I was at University. I also noted they all seemed so bright and committed to engineering as a profession. I recall feeling like that – and must confess I feel just as committed to our profession now as I did back then.

We had a good evening and signed up 40 new members to our institution. We also encouraged them all to join EA too. That's how we roll here in Oceania – we aren't competing with either IPENZ or EA. On the contrary, we work closely and cooperatively with our kindred institutions. That's how it has been, and how it should and will be. It's about delivering value to our members; be that access to local events, networking with likeminded engineers in ours and (gasp horror) other disciplines and institutions too!

Having been elected as Chairman on a mandate aimed at delivering value to our members here in Oceania, that's exactly what the Oceania Regional Committee is intending to do for our 1800+ members in the region. That might be a revelation to some – there are over 1800 of us IMechE folks in Oceania. Recently when I was in Wellington, I took the opportunity to meet the CEO of IPENZ. I was reassured that our two institutions are very much aligned. Collaborative and cooperative working together for the benefit of all engineers is the shared goal. We did note that in NZ the membership maths was similarly striking; IET, IMechE and ICE have 1500 members between them across the north and south islands. That's equivalent to 10% of the total IPENZ membership!

So we'll continue to put on learned society events as locally as volunteers and resources allow. We'll continue to offer professional interview and fellowship interviews locally in our region. We'll push hard to expand the ever so successful competition "Speak out for engineering", targeting every state in Australia (now including Tasmania and maybe the ACT next year too), we aim to have at least 3 competitors from New Zealand to be eligible to compete in the Regional final, with the winner having the chance to compete in the international final scheduled tentatively for Trinidad this year! Each round carries with it a prize of the equivalent of 300GBP which, given current exchange rates, for only a 20 minute presentation must be the best hourly rate the competitors will get in their engineering careers for quite a few years.

On the subject of monies – the Oceania committee remains committed to securing a method to enable those in our region with lower wages to be able to afford memberships. The University of Lae in PNG produces many fine engineering graduates each year, but a standard membership fee forms a significant proportion of a typical recently graduated engineer's local wage. Hopefully there will be a way found through this to enable the energy and enthusiasm of the PNG engineers to find a more permanent home in our institution after their graduation.

I hope by now you'll all have either embraced your PE online, or (as I have done) requested HQ to continue to send me a hardcopy version I can read during landings and takeoffs when 'all electronic devices must be powered off'. If you've done neither of these things – then that's why your PE has stopped arriving! Give your local committee representatives a hoy if you need assistance reconnecting with PE.

Finally, returning to that aging feeling. I was embarrassed at our annual face to face Oceania Committee meeting in Sydney last month to be a (somewhat lost) participant in a discussion about our ongoing and increasing use of social media to advertise events and engage locally with the membership, Apparently there is a face-tweet, twitterbook world happening out there, and the local IMechE is part of it. I'd tell you more, but feel I need to find a bright young thing to do so effectively.

- Twitter: @IMechE _ OzYM
- Facebook: IMechE Australian Young Members

Maybe I am getting old. But I'm sure enjoying the journey.

IAN MASH
Oceania Chair

VICTORIA NEWS

It has again been an energetic time for the Victorian panel with a number of events being held over the last few months. This included, in late May, a visit to 'Performance at the Limit' a hands on workshop designed to develop team work through Formula 1 style interaction. The event enjoyed good attendance and positive feedback from members Victoria's annual Christmas in July dinner took place on 25 July at Coopers Inn. The guest

3D printed titanium Christmas bauble quiz prize.

speaker this year was Chad Henry of the CSIRO Additive Manufacturing Group who delivered a very interesting and thought provoking lecture on current research into titanium 3D printing.

In early August Victoria also enjoyed a visit from the Vice President of IMechE Professor Allan Lau who is based in Hong Kong. Despite a very hectic schedule, Professor Lau kindly gave up some of his time to deliver members a lecture entitled 'The Development of the Aviation Industry within the Asia Pacific Region'. The lecture was held at RMIT University on 12 August and attracted a large turnout. Professor Lau's lecture covered many aspects of the aviation industry and the potential impact of its continued growth. The lecture was presented with strong enthusiasm and humour and finished with a lively Q & A session. The lecture was followed by a relaxed and informal dinner.

As the end of the year begins to approach, there are a number of events in the pipeline for Victoria. They include our annual Speak Out for Engineering (Victoria and Tasmania) competition and two technical lectures which include the Matangi EMU Train Project for Wellington and Thermal Monitoring of Railway Track. We also plan to hold a couple of social networking nights and I encourage members to come along, these evenings are a great opportunity to have a drink and a chat with fellow peers. As always, there will be an end of year Christmas function which is sure to be a lot of fun.
I would like to take this opportunity to express my thanks to the IMechE Victoria panel for all their hard work and dedication in achieving an outstanding 2015.

Vic Panel Chair Matthew Cook and IMechE vice president Professor Lau

Matthew Cook
Victorian Panel Chair

QLD NEWS

Queensland's crew of volunteers have been busy performing Professional Review Interviews for prospective Chartered Engineers in and around Brisbane recently. This is currently a high workload for the core team of volunteers and again a plea goes out to others to assist where they can.
The Mechanical Engineering dinner was held in Brisbane, with an exceptional presentation by Professor Christine Chales on "Nanomaterial and Space Propulsion - what is the future outlook?" garnering excellent feedback from members.

The next quarterly meeting is to be held in the Brisbane Square Library on 10th September. This will hopefully include a presentation from the panel chair providing a brief overview of my career and the more interesting aspect of my career spent as an Artificer on-board HM Submarines in Royal Navy serving on-board nuclear submarines. The main meeting will focus on the future of the IMechE in Queensland and what we can do to generate interest, so attendees and more importantly prospective volunteers are required. Your institute is what you make it.
One of the items for discussion is a lawn bowls or barefoot bowls event at Christmas time which is always popular.
Please support with ideas for future events or articles for inclusion into newsletters and the main magazine

Wolfy Dempsey
QLD Panel Chair

NSW NEWS

We have been very busy here in NSW these past few months with lots of activity and planning for some exciting talks the rest of this year!
The NSW Panel has been doing a university roadshow, presenting to up-and-coming mechanical engineers on the various career paths one can take with a mechanical engineering degree, as well as the benefits of joining the IMechE as an Affiliate member and being involved in our young members group in NSW.

In June we presented to over 50 students from the University of Technology in Sydney and in August to over 70 students from the University of New South Wales. Both events were extremely successful and we followed our presentation with Q&A with pizza and drinks. We hope to continue our roadshow with plans to present at Macquarie and Sydney University later this year.

The NSW Mechanical Chapter have had some technical presentations of late in conjunction with IMechE, EA and ASME at the Engineers Australia auditorium in Chatswood.
In June, Professor Mary O'Kane, NSW Chief Scientist & Engineer, presented on Science & Engineering Advice to Government. As Chief Scientist & Engineer, Mary O'Kane is responsible for providing the NSW Government with the best quality advice on policy decisions requiring science and engineering input. She is also responsible for seeing that the State's research system operates to maximise its productivity, economic value and social responsibilities.

In this presentation Professor O'Kane described how she and her office work to provide independent advice to government on difficult policy issues, broker partnerships between the public and private sectors and help to invest in high impact research to benefit the people of NSW. This session was very well attended with lots of Q&A.
In July, IMechE chartered engineer Olivier Loyez gave a presentation on "What you always wanted to know about air conditioning". Air conditioning in one shape or another has been in existence for several millennia. It is now part of our daily lives and takes many forms, from basic

passive systems to energy hungry and elaborate mechanical systems. In this presentation, Olivier gave an overview of Heating, Ventilation and Air Conditioning (HVAC) systems and their applications in buildings. Air conditioning is generally aimed at providing comfortable working or living environments but also encompasses close control of environmental conditions for specific applications such as artwork storage, operating theatres and computer rooms.

We have more exciting presentations planned for the rest of the year so we hope to see you at the following events:

- 17 Sep: The Presentation Blueprint: The skills you need to captivate an audience
- 19 Nov: Formula 1 - Life on the F1 Renault Circuit
- October 15: Speak out for Engineering Competition (SOFE)
- December 2: The NSW Panel Social Networking night

Monika Sud
NSW Panel Chair

WA NEWS

This year has seen a couple of notable highlights. Two of our presentations in conjunction with EA have seen some of the highest attendance in recent years, with one of our presentations standing room only in the 80(100?) seat EA Auditorium!

This presentation was given by James Fairbairn, a partner with a leading executive search firm and whose book "Career Karma - Maximising your career potential" is due for publication this year. James presented on 'Realising your career potential' which covered how different your career path and life could look if you knew how to triple the odds of hearing about your perfect career defining job or quadruple the odds of obtaining an interview from a resume submission. These are valuable skills helping to provide a differentiator in a competitive marketplace as well as providing excellent continuous professional development advice. James has, through his family history, very strong ties with the IMechE through Sir William Fairbairn, who was our 3rd President following Robert Stephenson! By James's own admission though, sadly he doesn't possess an engineering bone in his body!

The second very well attended presentation was on the common mistakes made by SME's and commonality across the business sector. Considering SME's are the lifeblood of our economy and collectively the largest employer of Australians, eliminating the common mistakes that are made repeatedly by these businesses across the many sectors in which they operate offers opportunities for maximising their potential.

Our presenter, Chris Byles, was one of our SOfE judges last year and has followed up his much appreciated support and involvement with this presentation. Qualified in Chemistry & Metallurgy, Chris has over 35 years' experience in business development, senior management & operations, before moving into the training & coaching field in 2005. Over the past few years clients where Chris has coached or trained personnel include Accenture, BHP, Rolls-Royce, Standard Chartered Bank, Schlumberger, Unilever and a number of Miss World contestants.

This year has seen a surge in requests for Professional Review Interviews. Our small band of volunteers has stepped up admirably and a request for additional volunteers from HQ was well met with 7 new volunteers joining. In recognition of their sterling effort, the WA Panel has organised a networking event to recognise this much appreciated work and to kick-start a forum for networking for the volunteers to share and learn from each other. We are always happy to welcome more volunteers, so please do not hesitate to contact me.

Another exciting development has been in meeting with local companies and presenting to their staff on how to gain elevation to member with the IMechE, with the panel chair presenting

James Fairbairn – WA event speaker "Realising your career potential"

recently to OneSubsea in Perth. The response has been extremely positive and we hope to welcome some new members soon. Looking to leverage on this success, the Panel is hoping to roll out this presentation to at least 2 more organisations.

On a sadder note, we have had to bid goodbye to two very active Panel members. Paraic McLoughney has had to return to the UK due to his changing role with BP – we wish him and his family the best for the future and thank him for his support. Another big loss has been has been Dr. Terry Love, who was not only an active Panel member but has served the IMechE Australian Branch very well as the Branch IT Representative. Terry's work in Academia made him a natural link to our WA educational institutions and he will be sorely missed.

Looking ahead, we have some exciting events approaching including a visit to Subsea7 who operate one of the world's largest and most advanced fleets of Remotely Operated Vehicles, the aforementioned networking event for our PRI volunteers and the Speak Out for Engineering competition. As mentioned, if anyone is interested in becoming more involved either as a Panel member and/or interview volunteer, please don't hesitate to get in touch. I look forward to hearing from you

Ian Kirk
WA Panel Chair

METRO TRAINS MELBOURNE RAIL TEMPERATURE MONITORING

On days with temperatures of 38°C and above, trains have to be slowed down to counter the risks associated with track buckles which may lead to train derailments. In extreme heat events train services may stop running entirely.

Heat buckled rails

The general consequences of extreme heat events are also; track circuit failures, point failures, overhead line sag and overheating equipment. Rail buckles however, pose increased safety risks for both staff and passengers. Buckling of track can lead to derailment, events such as Jolimont (January 2009) or more recently Croydon (January 2013). Both of these events had potential to severely injure those on the train.

Heat is not the only factor that causes rail buckles, it is in conjunction with other factors such as ballast deficiency, track disturbance (i.e. activities that may change the ballast condition and track geometry), rail creep, seized joints, insufficient expansion gaps, misalignments, change in sleeper type, and importantly low stress free temperatures (SFT).

The configuration of track components varies across the MTM network creating inconsistencies on any one section of a line. It is not surprising that there are many areas where the sleeper type changes from timber to concrete or the type of rail and ballast condition varies. This change poses additional risks to rail buckles. Timber sleepers allow for more movement of the rail compared to concrete sleepers which is a stronger and more rigid material. The change in allowable movement between the two sleeper types places even more stress on the rail, particularly in combination with poor ballast shoulders. Ballast acts as a stabilizing bed for the sleepers, restricts creep and reduces the load to the formation.

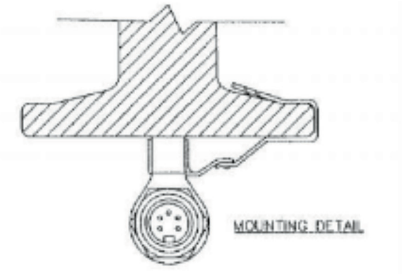
MTM has in place an annual infrastructure delivery summer readiness plan which manages to reduce the risk of track buckles during hot weather through controlled works that include re-stressing, ballast cleaning and re-shouldering and sleeper and tie renewals. It is important to note that the annual plan also includes works required for the other delivery areas such as electrical networks, signals and OCS.

Such works are important because the SFT reduces over time, particularly in areas where there has been recent works or where there is heavy rail traffic. It is also worthy to note that MTM prohibits track work during the summer.

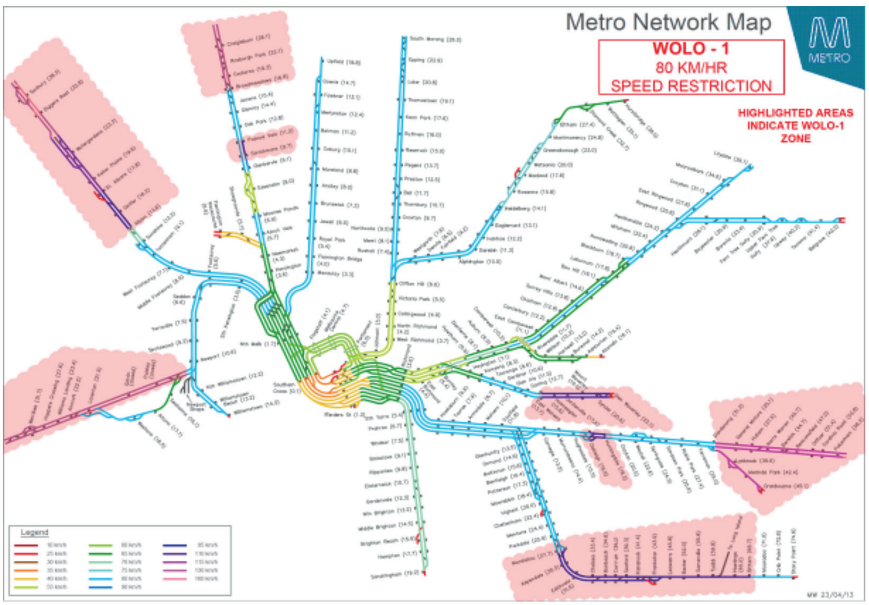
To achieve a desired SFT temperature (in MTM's case it is 38°C), the rail is mechanically stretched, tensed and thermally altered before it is clipped down to the sleeper. At the SFT, it is expected that there would be no compressive and contractive forces acting within the rail. To control the risk of buckling during hot weather, the SFT is chosen to be around the mean ambient temperature during Victoria's summer period.

Critical rail temperature (CRT) is an indicative temperature which will determine what mitigations should take place, whether it is constant monitoring by track workers, speed restrictions or halting of services. This is because once the CRT is reached the risk of buckling will significantly increase. The critical rail temperature can be calculated using the SFT as a baseline, the value is then increased or decreased based on recent track disturbances, existing deficiencies and overall condition of the track. The allowable rail temperature before a speed restriction is required on the MTM network is approximately 60°C. Applying speed restrictions to a corridor reduces the lateral and dynamic forces placed onto the rail by rolling stock therefore reducing stress experienced.

The former method of applying heat related speed restrictions within the MTM network relied on ambient air temperature forecast from a centralised weather station. The equivalent rail temperature is approximately 17°C higher than the ambient air temperature. Speed restrictions were network wide, arranged the night prior and applied from 12 noon until 20:00hrs. Two possible speed restrictions exist an 80km/hr or 70km/hr for when temperatures reach and exceed 38°C and 42°C, respectively. There were some concerns with this approach:



- The temperature may not reach the forecast temperature or alternatively exceeds the forecast outside of the 12:00hr – 20:00hr period.
- Actual rail temperatures are far lower than the centralised air temperature forecast on account of local factors including shade, wind, humidity.
- Actual rail temperatures exceed a critical rail temperature threshold due to local conditions therefore exponentially increasing the risk of rail buckles even though ambient air temperature is within specified limits.



Location specific speed limit zones

MTM aspired to improve its management of extreme heat events by obtaining more accurate and timely rail temperature information from across the network. This was achieved through the implementation of a remote monitoring system that allows enforcement of heat related Temporary Speed Restrictions (referred to in the industry as "WOLO") on a corridor by corridor basis with potential of line specific restrictions only when required.

Real-time temperature monitoring equipment has been installed across the MTM network at 32 locations approximately 10 km apart coming from the inner city outwards. The real time data is accessed via a web based interface that provides a heat map of the network and possesses analysis tools that allow for temperature limits to be set and monitored.

The predetermined warning limit that is used is a rail temperature of 55°C which corresponds to a worst case air temperature of 38°C (full sun and no wind) in which a speed restriction of 80km/hr may apply.

Each monitoring site is equipped with:

- Temperature sensor probe with range of -5 to +75 °C;
- Data cable;
- Data logger (Atlas MiniLogger);
- 3G/GPRS modem/router

Every monitoring site is within 20m of a Signal Enclosure where the majority of the equipment is situated and powered. The temperature probe is clipped to the foot of the rail as shown in the image on the previous page.

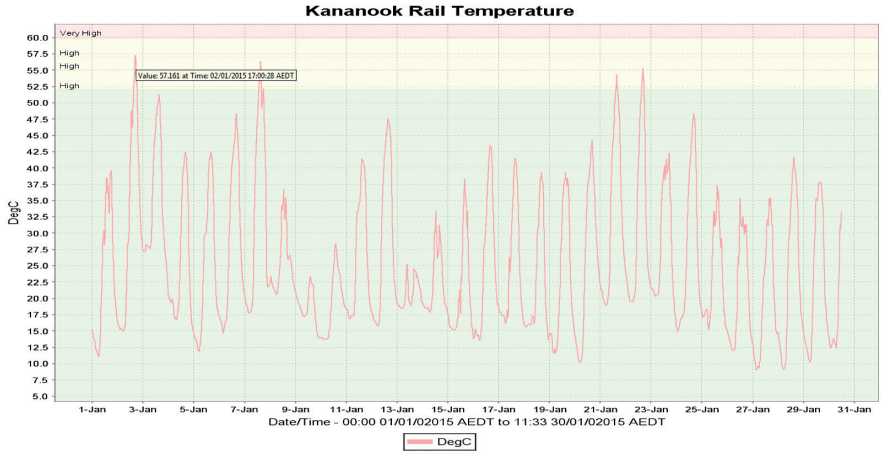
The system possesses diagnostics which show health and power usage of the equipment. Trends and graphs can be generated from logged data. The frequency of temperature logging is currently set at 5 minutes which can be changed to suit current business needs. The logged data is temporarily stored on the corresponding MiniLogger and sent via the 3G modem/router to a centralised MTM server.

The dynamic application of heat related speed restrictions is achieved through the use of flip boards that state the reduced track speed for that section (i.e. 80 km/hr) in conjunction with regular radio announcements as an additional measure of safety. These boards are located at the start and end of high-speed areas that are susceptible to the effects of heat in accordance to the WOLO Procedure.

An opportunity exists for V/Line (the Regional Train Operator) to adopt this monitoring system to manage their heat related speed restrictions thereby creating an integrated Victorian rail monitoring system.

The 2014/2015 summer did not produced many hot days but it is anticipated in coming years that Speed Restricted days will be fewer in number, and applied to significantly lower kilometres of track on the network.

The net result of the introduction of this technology will be a train network that is more resilient to the climate extremes and greater utility for the travelling public.



Andrew Lezala
Vic Panel Member

NOMINATIONS FOR 2016/2017 AUSTRALIAN BRANCH OFFICE BEARERS

Included in this edition is a nomination form for 2016/2017 office bearers. A ballot paper will be included in the January 2016 edition of the News Bulletin. The closing date to submit ballot papers is 31 January 2016. Results of the ballot will be announced at the AGM on 12th of March 2016
Please note that there will be no election or voting at the AGM.
The newly elected office bearers will take up their duties during the third week of May 2016. All positions are declared vacant. The positions to be filled are shown on the voting form below.

The first stage is for members to nominate a person of their choice for a specific position using the nomination form contained in this issue of the News Bulletin. The form must be countersigned by the nominee to ensure their acceptance.

Please send the nomination form to the Branch Chairman, Leslie Yeow, at the address on the form, to arrive no later than 30 November 2015.

A list of nominations will appear in the January 2016 issue of the News Bulletin.

Notes:

In the interests of a seamless transfer of responsibility for Branch activities, it has been found that the Branch Chairman should be chosen from among those who have served an immediate previous term as a Branch Committee Member.

Institution of MECHANICAL ENGINEERS

AUSTRALIAN BRANCH NOMINATION FORM (2016/2017 OFFICE BEARERS)

Return to AustraliaChair@imechenetwork.org

Or, Mr L Yeow
Chairman, IMechE Australian Branch
149 Grafton Street
Cairns Qld 4870
Closing date for nominations: 30 Nov 2015

Dear Sir/Madam,

I,……nominate ……for the position of (tick box below);

Position on the Australian Branch Committee	*Tick box*
Australian Branch Chair	
Australian Branch Honorary Secretary	
Australian Branch Honorary Treasurer	
Australian Branch Assistant Honorary Secretary & News Bulletin Editor	
Australian Branch Young Member Section Chair	

Yours faithfully,

……
(Signature of nominator) (Date) (Membership no.)

I, …… accept the nomination

……
(Signature of nominee) (Date) (Membership no.)

Note to nominee: Please attach to this form a short statement (~100 words) giving details of your education, career, date of joining IMechE, involvement with Panel or Branch and your vision statement for the nominated

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