09 | 2010

engineers canberra

ENGINEERS AUSTRALIA
Canberra Division

From the President

When I became President late last year, I identified several important policy issues that require engineering expertise. These included the Emissions Trading Scheme and the Carbon Pollution Reduction Scheme, the National Broadband Network, water resources, and public infrastructure. To this list I would now add renewable energy. All of these are even more important now than they were then.

In addition, over the last few months, we have heard much discussion about sustainability and Australia's population. National President Doug Hargreaves has raised the subject of population in his President's article in our Engineers Australia magazine. He is urging all of us to participate in the discussion. If you haven't already done so, please complete the survey on the impacts of population growth on the EA website www.engineersaustralia.org.au .

Increasing population brings with it increased demands for all types of infrastructure. We, as members of the engineering team, together with other technical professionals, are best able to develop and implement the technical solutions necessary to meet these demands.

As I listened to televised interviews with our political leaders during their election campaigns, it became very apparent to me that on many of these major infrastructure proposals, such as the NBN and other high-speed data and communications networks, they struggle with the technical aspects and complexities. Lack of technical understanding is wide-spread throughout the community.
It is up to us as technical professionals to understand the technical aspects of these proposals and to explain them to others in the community in terms that non-technical people can understand. It is vitally important that politicians and other decision-makers have sufficient understanding of these technical aspects to be able to appreciate the impact the proposed infrastructure will have on us all and the risks and trade-offs necessary to achieve optimal, best value-for-money solutions.

Engineers Australia is playing a significant and valuable role in the public debate on many of these

2010 YEAR OF ENGINEERING LEADERSHIP

issues. Last year, Canberra Division ran public forums on the NBN and the proposed ETS as part of its Australian Engineering Week activities. This year, we ran a very successful public forum on 'Living Sustainably in Cities' and in July we released the ACT Infrastructure Report Card. These are examples of how EA is engaging with the public and informing the public of many of the technical as well as social and economic aspects of infrastructure development.

It is also our role to develop technical solutions and to make the wider community aware of possible solutions. Planners and policy-makers in particular must be kept informed of new developments in technology and likely future developments.

I participated in a forum on climate change policy recently in which an economist spoke about projections for energy use and the likely mix of sources of energy, renewable and non-renewable. But his projections were based on simple extensions of current technology. He had very little basis for factoring in to his projections likely advances in technology that could lead to substantial increases in the efficiency of energy production

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Canberra Division Annual General Meeting

Wednesday 15 December 2010 – 5.30 for 6.00pm

The Annual General Meeting of Engineers Australia Canberra Division will be held in the Auditorium, Engineering House, 11 National Circuit, Barton on Wednesday 15 December 2010 at 6.00pm.

Refreshments will be available from 5.30pm. All members are welcome to attend.

ENGINEERS AUSTRALIA
Canberra Division

From the President, continued from page 1

or reduction in costs. Therefore his projections could be unduly conservative. Many of the major decisions made now about projects whose impacts will last for decades will be based on these sorts of projections. It is up to us to make our planners and policy-makers aware of likely advances in technology to ensure that these are properly taken into account in developing new policies.

Canberra Division regularly has the opportunity to provide comment or make submissions on matters of public policy. Surveys show that members regard contributing to policy development as one of EA's most important roles. This not only contributes to public policy but also lifts the standing of the organisation and the profession. Often it falls to members of the Division Committee to develop these submissions or respond in other ways. If members become aware of invitations for comment on public documents such as draft regulations or for input into public enquiries, please bring these to the attention of the Committee. We would welcome members' support in the preparation of responses.

We will soon be calling for nominations to fill positions on the Division Committee. Committee members are involved in a wide range of challenging and interesting issues. If you would like to be involved with the management of Canberra Division please consider nominating for these positions.

Denton Bocking
President

FOR UPDATED INFORMATION ON THE TECHNICAL PROGRAM AND OTHER EVENTS CHECK OUT THE CANBERRA DIVISION WEBSITE:

www.engineersaustralia.org.au/canberra

Fellows Lunch 2010

The Fellows Lunch was held on Tuesday, 13 July 2010, at the National Press Club, BARTON and incorporated the Launch of the ACT Infrastructure report Card 2010.

The Fellows lunch is a prestigious event on the Engineers Australia calendar and recognises the eminence of the Fellows of Engineers Australia.

Fellows Certificates were presented to (left to right) Dr Grahame Crookham, Mr Peter Evans, Mr Rod Weeks, Mr Denton Bocking, Col Neil Greet and Mr Gareth Jones.

EMINENT SPEAKER SERIES

ITE&E Branch, IEEE & IET

Monday 13 September 2010 – 5.30 for 6.00pm
Engineering House, 11 National Circuit BARTON

The Engineering Leadership required in the development of Complex Systems

Speaker: Dr Terry Stevenson

Terry will provide an overview of the 'Engineering Landscape' involved in the development of Complex Systems. This landscape is very broad; covering a wide range of topics from what is complexity to leadership, team behaviour and dynamics. As part of the presentation, three domain specific technologies of Radar, Communications and Robotics are looked at, as well as where these technologies are heading. Integral to the presentation is the need to make trade-offs as part of every design and the available technology. Terry will also provide a view that engineers need to constantly look outside of their domain area to get inspiration and views from other fields – in the case of Raytheon, this area has been Neuroscience and examples are drawn from this area. An overview of the revolutions currently occurring in engineering and science as well as the effects this has on development will be discussed along with attributes of technical leadership and the 'leader of the future'.

As the Chief Technology Officer of Raytheon, Terry is responsible for the introduction of new technology, R&D and the leadership of all aspects of engineering across the company. Terry graduated from the NSW Institute of Technology with a Bachelor of Electrical Engineering and also from UTS with a Doctorate in Telecommunications. He has recently completed a MBA through QUT. Prior to Raytheon, Terry was the Technical Director of Boeing, Data Communications Manager & Group Engineering Manager for Stanilite Electronics and a private consultant. He currently sits on a number of business and academic advisory boards and has a joint international patent in Spread Spectrum Communications

Note: There is a $10 attendance charge for Non-Members. Members of Engineers Australia can attend for free. RSVP & any payment due is to be made via the online registration link www.engineersaustralia.org.au/eminentspeaker

ENGINEERS AUSTRALIA CANBERRA DIVISION

TECHNICAL PROGRAM

CPD events for the Engineering Team

All presentations will be held at 'Engineering House', 11 National Circuit, Barton unless otherwise specified.
For catering purposes please RSVP for all meetings to cmays@engineersaustralia.org.au or phone 6270 6519.
Full details of each meeting can be found at www.engineersaustralia.org.au/canberra under Technical Program.

Date/time	Branch/Group	Topic	Speaker/notes
SEPTEMBER 2010			
Mon 13 5.30 for 6.00pm	ITEE	**The Engineering Leadership required in the development of Complex Systems**	Eminent Speaker - Terry Stevenson, Chief Technology Officer of Raytheon
Tue 14 5.30 for 6.00pm	SSEE	**Development of New Solar Cell Technology**	Dr Kylie Catchpole, ANU
Wed 15 5.30 for 6.00pm		**Introduction to proposed new Royal Charter & By-Laws**	Rupert Grayston (Deputy Chief Executive Engineers Australia), Jennifer Murray & Tom Brimson (Congress Representatives)
Thu 16 12.00 for 12.30pm	Transport Branch	**"The Loop" Bus Service**	Dave Gray, Parramatta City Council
Tue 21	Retired Engineers	**Bus Tour to Mittagong – Tour of the Fitzroy Iron Works**	
Tue 21 5.30 for 6.00pm	ITEE	**ANZAC Frigate anti-ship missile defence project – a systems view**	Captain Rob Elliott
Wed 22 5.30 for 6.00pm	YEA	**Financial Planning Seminar**	Helen Elliot
Tue 28 5.30 for 6.00pm	Civil/Structural	**Prevention of delays & injuries on construction sites**	Luis Martinez & Colin Kish
Wed 29 5.30 for 6.00pm	Mechanical	**What makes a great design engineer**	Eminent Speaker – Dianne Boddy
OCTOBER 2010			
Wed 6 5.30 for 6.00pm	Risk	**Risk management re mortuaries, evidence collection and disaster victim indentification**	Dr Lavinia Hallam
Tue 19	Retired Engineers		
Tue 19 5.30 for 6.00pm	ITEE	**ITEE Student Presentation Award Night**	
Wed 20 12.00 – 5.00pm	RISK	**Risk Management and Beyond – Lessons Learnt and Innovations**	Half day Workshop, Regatta Point
Wed 20 5.30 for 6.00pm	Mechanical	Part 2: **Changes to the Building Code of Australia (BCA) 2010**	John Kennedy
Thu 21 12.00 for 12.30pm	Transport Branch	**Joint Function with Planning Institute of Australia (PIA)**	Colin Lyons (PIA) Jeff Bell (Land Development Agency)
Tue 26 5.30 for 6.00pm	SSEE	**Participatory approaches to multi-level governance in the water sector**	Dr Katherine Daniell, Centre for Policy Innovation ANU
NOVEMBER 2010			
Wed 10 5.30 for 6.00pm	Mechanical	**Nano-engineering & AGM**	
Tue 16 5.30 for 6.00pm	ITEE	**AGM**	
Wed 17 12.00pm	Retired Engineers	**Christmas Function**	Town Centre Sports Club
Thu 18 12.00 for 12.30pm	Transport Branch	**Traffic Impact Assessment Guidelines**	Tim Morath
Tue 23 12.00 for 12.30pm	WIE		Former American Astronaut Dr Jan Davis
Tue 23 5.30 for 6.00pm	Civil/Structural	**Protecting Embassies – How emerging technologies and ideas are retrofitting embassies in a changing security environment + AGM**	Darran Roper, Department of Foreign Affairs and Trade (DFAT)
Wed 24		**Excellence Awards**	
Thu 25 – 2.00pm	National Office	**Engineers Australia 90th AGM**	Hyatt Hotel Canberra
DECEMBER 2010			
Thu 2 12.00 for 12.30pm	Transport Branch	**Action REDEX Trial**	Kuga Kugathas, TAMS
Wed 15 5.30 for 6.00pm		**Canberra Division Annual General Meeting**	

Disclaimer: Those without email addresses should contact Colleen Mays (02) 6270 6519 to check if a Technical Presentation has not been cancelled.

ACT Infrastructure Report Card 2010

Engineers Australia has been rating Australia's infrastructure since 1999. In 1999, 2001 and 2005, national report cards were published. In 2003, 2004, and 2005, report cards on States and Territories (including the ACT) were published. Ratings run from A (very good) to F (inadequate).

The objective of the Report Cards is to rate the quality of economic infrastructure, in order to raise awareness that infrastructure underpins the community's quality of life and that inadequate infrastructure impedes economic and social growth, and reduces environmental and societal sustainability. It is hoped that the information and debate generated by the report card process will improve the policy, regulation, planning, provision, operation and maintenance of infrastructure.

The 2005 ACT Infrastructure Report Card was released on 13 July 2010. It was the fourth to be released in the 2010 National Series, which will culminate with the release of the National Report Card ratings in November.

The report card was the result of a comprehensive research and review program undertaken by Athol Yates of the Homeland Security Research Centre, under the oversight of a Steering Committee comprising me, Past Division Presidents Tom Brimson and Bob Nairn and Gordon Davidson. In addition, many Canberra Division members gave their time to review and comment on the various chapters. I am most grateful to all of them for the time and effort that they devoted to this task.

The results of the 2010 ACT Infrastructure Report Card indicate that while the ACT has benefitted from high quality infrastructure that existed prior to self government, much of that infrastructure is reaching the end of its life or is reaching its capacity. While the majority of our infrastructure sectors are currently of good quality, some flaws are appearing and there are concerns about matching the needs of the Territory's population growth.

The ACT ratings across the various infrastructure sectors are shown on the table below, along with past Act and National ratings.

The most intriguing rating is probably the 'F' given to rail – this certainly attracted a lot of media comment at the time of the release. However, this rating was not given lightly – the committee was concerned that there is no clear vision for the future of rail in the ACT at any level and that the existing infrastructure, including its connections into the NSW system, is inadequate for competitive passenger and freight services.

Rolfe Hartley launching the ACT Infrastructure Report Card 2010

The report also felt that, while improvements in road infrastructure have occurred, road usage has increased at a faster rate. More work is needed to manage demand and to improve the amenity of modes of travel other than the private car. Without this, road and parking congestion will increase and sustainable transport outcomes cannot be achieved.

If the 'F' rating for rail is disregarded, Canberra's overall rating is in the 'B' range, i.e. Good. This is considerably better than the overall rating for other States. However, we must not be complacent about this and we must keep Government, business and the community focussed on the work needed to ensure that Canberra's infrastructure keeps pace with our population needs, both in terms of new infrastructure and infrastructure maintenance.

A copy of the full Infrastructure Report Card is available at www.engineersaustralia.org.au/ircact

Rolfe Hartley
Chair, ACT Infrastructure Report Card Committee

Infrastructure Type	ACT 2010	ACT 2005	National 2005	National 2001
Roads	B	B	C	Not rated
Rail	F	Not rated	C-	D-
Airports	B-	B	B	B
Potable Water	B-	C	B-	C
Wastewater	C+	B	C+	C-
Stormwater	C+	C	C-	D
Electricity	B+	B	C+	B-
Gas	A-	A-	C+	C
Telecommunications	B-	Not rated	Not rated	B

Engineering Week

We couldn't get those flags flying this year and with the Australian Science Festival also coinciding with Australian Engineering Week (AEW), it provided a challenging environment for us all. I hope you, family and friends were able to participate in some, if not all, of our AEW activities.

Australian Engineering Week is a public awareness and education campaign that aims to highlight the role and achievements of the engineering profession in Australia and all of our events were designed to appeal to the community at large. This year our AEW activities, with a Make It So theme, showcased the diversity of engineering.

For the first time, we had a luncheon launch with Mark McCrindle, who is recognised as one of Australia's foremost social researchers, speaking on the topic 'Social Impact of Stereotypes and Role Models'. With the launch later this year of Barbie's 126th career as a Computer Engineer and the *Make It So* campaign where one of the themes was 'I can be an Engineer', the topic 'Social Impact of Stereotypes and Role Models' seemed ideal. What would be the impact of this Barbie on a new generation of girls and boys?

We hosted the 'Engineers Without Borders 2010 Challenge', showing just what can be achieved by our first year engineering students. Our future engineers were well supported by our audience and are separately featured in this newsletter.

Our 'Living Sustainably in Cities' forum attracted a large and very interested audience and the questions just wouldn't stop. With both presentations and a panel discussion, we got insights into some of the ingenuity and thinking that is out there and an appreciation of the considerations that go into sustainable building design and development.

We supported the Rotary Careers Market which is specifically for senior students and our thanks must go to our volunteers from Women in Engineering, Engineers Without Borders and the Young Engineers for giving up their working time over these two days, supported by National Office staff. If just one student walks away thinking 'I can be an Engineer and that's what I want to do' – it will have been a great success.

Our second forum 'Reach for the Stars' highlighted the engineering challenges with the Square Kilometre Array and the Giant Magellan Telescope projects – with plenty of opportunities for Australia. The interest and questions were running hot that evening.

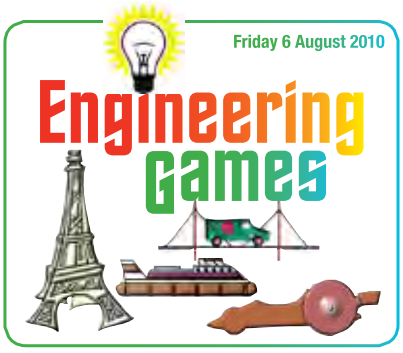
Our stalwart activity, the Engineering Games, was once again held at Questacon, with over 300 students from primary, secondary, college and Institute of Technology (CIT) – vying for some great prizes for the different games. It was great fun and there is some real ingenuity out there – and some very serious straw tower builders. There were at least two primary school children who asked for detailed information on the tower weight to load ratios that had been achieved on the night.

A fitting end to the week was the presentation and unveiling of a National Engineering Heritage Landmark for Antenna DSS-46 at the Canberra Deep Space Communication Complex, Tidbinbilla. It was Antenna DSS-46 that brought the pictures of Neil Armstrong and Buzz Aldrin as they took their historic first steps on the moon back in 1969, into homes around the world. It was also recognition of the tremendous contributions made by Australians in the various NASA space programs over the years.

Engineering Week is a team effort, and I'd like to thank all the Committee members who put our program together as well as the volunteers, who helped at the various activities during AEW. But it is you and your participation that has made this year's Australian Engineering Week a resounding success.

Jennifer Murray,
Chair, AEW Committee

Engineering Games



Yet another Engineering Week has come and gone, and with it another fun filled evening of Engineering Games with the next generation of up and coming engineers at Questacon ... only this time it was different.

For the first time in more years than any can remember, Graeme and Barbara Lowe were absent. Graeme and Barbara have run the Engineering Games for many years, but with Barbara's retirement from the Division Office and their up-coming travel plans, they have decided to pass the organisation of the Games onto others. The Division and all of the primary, secondary and tertiary students who have participated over the years owe Graeme and Barbara a large vote of thanks.

This year saw just under 220 entries from 330 students organised in over 160 teams or individual entrants, competing for up to 60 different prizes. Pretty daunting for a new Organising Committee.

Always popular with primary and secondary school students, the Games also saw entries from CIT, Burgmann College and Marist College. It was great to welcome some schools who had not previously participated.

The Games also owe their success to the willingness of Division members to give of their time to assist the Organising Committee on the night. For two hours, the reception hall of Questacon was abuzz with competitors, stressing their spaghetti bridges and straw towers, demonstration incredible ingenuity in construction of mouse trap powered race cards, encouraging hovercraft down a marked track or aiming for accuracy with their enlightened timers. Who would have though a structure of drinking straws, and weighing only 25 grams, could support a weight of 1.9kg, and that came out of the Junior Primary Division, or a small vehicle, powered only by a mousetrap, could travel over 44 metres.

All in all, 34 prizes were awarded in the fives games spread over four divisions, and a fun night, topped off by a Science Show by Questacon in the auditorium, was had by all. The Organising Committee is advised that a number of groups have already started the design process for next years Games.

The Organising Committee
Engineering Week
Engineering Games 2010

Engineers Australia Risk Engineering Society Seminar in association with Australian Defence Force Academy–University of NSW

Risk Management and Beyond: Lessons Learnt and Innovations

Wednesday 20 October 2010, 12.00 pm to 5.00pm
Canberra Business Events Centre, Regatta Point

The Risk Engineering Society (RES) is fortunate in that this year the Australian Defence Force Academy (ADFA), University of NSW is joining with us to present our annual seminar. This year will be different. Our normal practice has been to have one presenter for the day. On this occasion the presenter is to be replaced by a team of seven, most of who lecture at this academy and consult with various organisations including Department of Defence and Defence Industry. Professor Michael Frater, Head of Engineering and IT at ADFA, has initiated sponsorship for this occasion. ***Topics:*** Risks at the level of the Individual, the Project, and the Enterprise and Risk Education.

Registration fee will include lunch, afternoon tea and the presentations on a USB.

The registration form will be available on the website in September www.engineersaustralia.org.au/canberra under Events or contact the Division Office on (02) 6270 6519.

ACT Engineering students learning to engineer a better world

The top six teams from 100's of first year engineering students in the ACT presented their ideas for the 2010 EWB Challenge to an audience of over 60 as part of Australian Engineering week in the ACT in the first Engineers Without Borders Australia (EWB) ACT Regional Judging finals. Four teams from the ANU College of Engineering and Computer Science and two teams from the School of Engineering and Information Technology at UNSW@ ADFA presented solutions for challenges facing EWB's community partner, the Kooma Traditional Owners Association Inc. (KTOAI) in remote south-western Queensland, covering water supply, a suspension bridge and fish traps.

The judges, including members from EWB and YEAC, and all those involved on the night, were impressed by the ideas, enthusiasm, presentation skills and work of all the teams. In a very difficult decision, the Low-Cost Water Pumping Device team from the ANU were selected as the top team in the ACT. Their idea focused on using recycled material from the property to construct a low-cost wind-turbine diaphragm pump. This idea will now be considered as part of the ACT/NSW regional judging later in the year with the opportunity to be selected as the ACT/NSW region team to present at the national EWB Challenge presentations at EWB's national conference in November.

Each year since 2007, EWB has worked with one of its community partners to set the EWB Challenge based on design and engineering challenges the community is facing. First-year engineering students work in teams of four to six to develop innovative solutions to these challenges as part of their university studies, learning about team-work, engineering design, communication and sustainable development through real-world projects. In 2010, the EWB Challenge focuses on the Kooma Traditional Owners Ass Inc (KTOAI), a community 800 km due west of Brisbane, and over 7,000 engineering students from universities in Australia and New Zealand will take part.

EWB winning team from the ANU

EWB would like to thank and congratulate all the teams who presented on the evening for their efforts and work. Their reports will be considered for possible inclusion into EWB's ongoing work, and in this way these first year engineering students are already learning and contributing to the role and potential of engineering to improve the quality of life in communities around the world. EWB would also like to thank the ANU and UNSW@ADFA, in particular the course coordinators Haley Jones and Sean O'Byrne respectively, for their continuing support of the EWB Challenge. Finally, EWB would like to thank and acknowledge the KTOAI for their involvement with the 2010 EWB Challenge and their continuing support and generosity.

Jeremy Smith
Engineers Without Borders

ITEE Student Presentation and Award Night

Tuesday 19 October 2010
5.00 for 5.30pm

Engineering House,
11 National Circuit, Barton

This evening comprises of a competition between four final year undergraduate engineering students, two each from the ANU and UNSW@ADFA. The competition is based on a 15 minute presentation (plus five minutes of questions) on each of their respective projects.

Before the results are announced, there will be an Occasional Address.

Engineering Heritage Award unveiled at Tidbinbilla

Saturday, 7 August dawned bright and clear for the crowd gathered at the Canberra Deep Space Communication Complex (CDSCC), Tidbinbilla for the unveiling of a National Engineering Heritage Landmark for Antenna DSS-46. Engineering Heritage Canberra and Canberra Division President Denton Bocking, were pleased to host the National President of Engineers Australia Doug Hargreaves and Dr Miriam Baltuck, Director CDSCC, as our guests of honour at the ceremony.

Whilst located at its original site at the now closed Honeysuckle Creek Tracking Station south of Canberra, Antenna DSS-46 etched its place in history by relaying to the world the iconic video and audio of Neil Armstrong walking on the moon in 1969. Erected specifically for the Apollo program, this antenna continued to provide communication for the NASA manned space program beyond Apollo before being adopted for use at Honeysuckle for the unmanned (Robotic) deep space program. Following its move to Tidbinbilla in 1981, it continued in this primary role right up till its decommissioning late last year.

In his speech, Doug Hargreaves spoke to guests about the Engineering Heritage Recognition Program, and the qualities of significant engineering and social impact that the antenna possessed as part of Australia's involvement in one of the greatest engineering achievements of the 20th century, that of sending man to the moon and returning him safely to Earth. Dr Baltuck gave details on Antenna DSS-46 and the significant role it has played in the various NASA space programs over the years. Her speech indicated the depth of the attachment that all at CDSCC have to the antenna.

The antenna is now one of seven sites in the ACT to be recognised under the Engineering Heritage Recognition Program. Established in 1984 as a means of bringing public recognition to engineering works of heritage significance as well as to those engineers who created them, the aims of the program are to encourage the conservation of Australian engineering heritage, and to raise community awareness of engineering and the benefits it provides.

The weekend chosen to present the award was the cusp between Engineering Week and Science Week, thus providing an opportunity to celebrate the bonds between the two professions. The work at Tidbinbilla is a prime example of engineering making the science achievable.

Lyndon Tilbrook,
Chair, Engineering Heritage Canberra

Dr Miriam Baltuck speaking in front of Antenna DSS-46.

Doug Hargreaves and Miriam Baltuck unveil the National Engineering Heritage Landmark at Tidbinbilla

ROYAL CHARTER & BY-LAWS – VOTE YES TO MODERNISE

Engineers Australia is about to launch an historic membership ballot. In October we will be asking all corporate members to vote YES to make our governing documents modern, compliant and equitable.

This follows a landmark decision at a special two-day meeting in July, where National Congress finalised a complete rewrite of the Royal Charter and By-laws, to create a modern document written in Plain English. Developed after an extensive two-year review process and with substantial input from members and external experts, it would replace a 73-year old document that has been amended so many times it is at best confusing and at worst ambiguous. It is also inconsistent and has serious legal flaws regarding taxation.

The new document also contains an important symbolic policy change, and that is associates and technologists would be given the right to vote in future ballots affecting the Royal Charter and By-laws. The 50-person representative Congress voted overwhelmingly in favour of this as a final legacy of our 2008 Year of the Engineering Team.

The new documents will not change the governance or membership structure.

Members voted 20 years ago to include technologists and associates in our membership. Since then these groups have become an integral part of our diverse organisation. They represent Engineers Australia in senior office bearer positions and have shared in our strategic planning and major program development. This has strengthened, not weakened our organisation.

It is time to take the next step. It is time to update our governing documents to make them clear, equitable and robust. It is time to move our organisation forward.

It is only fitting that in 2010, the Year of Engineering Leadership, Congress is providing the leadership and vision we need to bring our key underpinning documents into the 21st Century, and modernise our organisation.

Doug Hargreaves,
National President
Engineers Australia