Why we don’t have more women engineers

IN 2007 FEWER THAN ONE out of ten UK engineering professionals were women – the lowest proportion across the EU and far behind Bulgaria and Sweden, with 29% and 26% respectively.

To test out ways in which to attract women into manufacturing and engineering, the Campaign for Industry and Higher Education (CIHE) commissioned Opinion Panel Research to survey six hundred women in their final or penultimate year at university. All these women had achieved A grades at GCSE for physics, maths and chemistry. Two-thirds had gone on to study two of these subjects at A level. However, none of them had gone on to study maths, physics, chemistry, engineering or manufacturing at degree level.

The idea behind this sampling strategy was that these women had highly numerate and logical ability and could, if they wished, translate those talents into manufacturing or engineering.

The research revealed that the female students surveyed could be classified into four broad groups based on their disposition towards careers in engineering/manufacturing:

- ‘Over my dead body’ (21%) Nothing would attract them to engineering or manufacturing.
- ‘Fresh starters’ (41%) Could be persuaded to take up a career in manufacturing and engineering, but are not doing the right degrees. These women may have dropped maths, physics, or chemistry after GCSEs or A levels.
- ‘Switchers’ (26%) Qualified in a relevant degree for the engineering/manufacturing industry and could be persuaded to enter it.
- ‘Enthusiasts’ (12%) Keen to have a career in engineering and manufacturing.

Perceptions

Respondents were asked to sum up engineering and manufacturing as best they could with the keywords provided:
- ‘Enthusiasts’ chose words such as “useful”, “innovative”, “intellectual” and “exciting”.
- ‘Switchers’ and ‘Fresh starters’ were most likely to say “male-centric” followed by “useful” and “innovative”, suggesting that shaking off the male-dominated image and creating female role models could help.
- ‘Fresh starters’, were as likely to use the words “dull” and “physical” as “innovative”. It seems that the sector’s image is putting off many talented women.

Conclusions

The research found that the key barriers faced by the engineering and manufacturing sector in recruiting larger numbers of women centre on lack of careers advice and negative perceptions of the sector. Specifically, careers advice appears to be the key barrier, and it helps to shape perceptions, as follows:

- Lack of careers advice at crucial junctures, in particular around GCSE level. Careers advice received later, such as, university application stage, is not likely to be as effective.
- Careers advice seems to be focused on potential ‘stars’, at the expense of less academically talented girls who nevertheless have potential in the sector.
- The sector is seen in a negative light by all except the most enthusiastic, and has a particular problem with being perceived as ‘male dominated’ and ‘dull’.
- Careers advice helps to shape perceptions - those who receive advice about careers in engineering/manufacturing see the sector in a more positive light.

The full report, ‘Great Expectations: Top Manufacturing and Engineering Talent 2030’ is available on www.cihe.co.uk/femalegraduatesurvey

Julia receives prestigious award

WES member Professor Julia King, Aston University Vice Chancellor, has been awarded the annual Lunar Society medal.

Recipients of the Society’s Medal are deemed to have contributed significantly towards the vigour of the West Midlands community. Julia receives this medal in recognition of her significant achievements and commitment to the fields of academia, business development and government advisory work.

Upon receiving the award she said: “I am extremely honoured to receive this prestigious award. The Lunar Society itself was formed in Birmingham in the eighteenth century by a remarkable group of pioneering individuals, who included two of the greatest scientists and innovators in the history of England – Matthew Boulton and Josiah Wedgwood. Experimentation, innovation and healthy debate to stimulate ideas are the hallmarks of the Lunar Society – all values which I believe in, and which are very much championed at Aston University. In receiving this award I would like to acknowledge the contribution of my colleagues at Aston – I couldn’t do what I do without their stimulating inputs, ideas, challenges and support.”

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Are we really getting there?

The theme of this year’s conference was ‘Getting there’. There is some evidence that women engineers are getting there. Speakers at conference had led many high profile contracts, including delivering transport solutions for next year’s Olympic Games. Isobel Pollock, who presented the Karen Burt Award, will, if all goes to plan, be the next IMechE president.

However, there is also the depressing fact that less than 10% of this country’s engineers are female – the lowest percentage in EU countries. The Campaign for Industry and Higher Education report (see p 1) looks at the reasons why girls, who appear to be academically qualified to become engineers, do not do so. Their main conclusions are that WES has been voicing for years; change workplace culture and give better careers advice at an earlier age. So gradually and slowly the message is getting through. We are getting there but progress is slow. Perhaps with the government’s new found enthusiasm for engineering (see President’s message), action will follow.

If the enthusiasm and enterprise shown by the young women engineers attending conference is a reflection of the future, we will indeed get there. Some of them have reported on the sessions that they enjoyed at conference on pages 6-8. They are all looking forward to making an impact in their future engineering careers.

Someone who made a big impact but is often overlooked nowadays is Hilda Hewlett. It is heartening that the centenary of her first flight was celebrated at Brooklands (see p 9).

Finally look out for an exciting new development in the next issue.

Pat Battams – editor

Next issue contribution deadline: 15 Jan 2012

Wanted: Engineers

NEW IET RESEARCH shows that nearly five out of ten companies are currently recruiting engineers but half of them are having difficulties in finding sufficiently skilled senior engineers with five to ten years’ experience.

The survey also revealed that the proportion of women in engineering roles has remained static (5% in 2008, compared with 6% now). The proportion of female technicians was 5% in 2008 and is 3% today.

Arlene McConnell, a systems engineer at Sellafield, the Young Woman Engineer of the Year, said: “There are various new initiatives in practice today.

However, I believe that the ‘leaky pipeline’ of women flowing into STEM is due to a lack of a single, coherent approach. This can only be achieved through consensus, discussion, and a unified voice. Once this is done, we should start to see more and more young women investing their intellect and skills into engineering professions.”

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All items for inclusion in The Woman Engineer should be sent to the Editor at the above address. The views expressed in this journal are not necessarily the views of the Society.
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The President’s message

WES has been represented at ICWES 15 in Melbourne, Australia and several WES members serve on the INWES committee. We offer support to our German counterparts from the deutscher ingenieurinnen bund (www.diboev.de) who are celebrating their 25th anniversary.

Our plans for next year are being finalised now. We hope to have two half-day events that will be supported by our major sponsors the IET and will be held in Glasgow and Birmingham. Bringing events to the regions will give more members an opportunity to take part. The theme that cuts across industries is health, safety and risk management. This will weaved through our regional events for the next two years and culminate in a major conference in 2013. I would appreciate your input to these plans. Please send your ideas to me at president@wes.org.uk.

I would like to urge you to promote the Karen Burt Award to your professional institutions. We seek nominations from the institutions for this annual award given to a woman engineer who has recently reached Chartered Engineer status.

There are many things we would like to do. We seek more members to join WES Council in order to make sure your ideas become a reality. The Society relies on volunteer effort for most of its activities, which has its pros and cons. It ensures that we remain independent but reduces our capability to bring to fruition all the brilliant ideas we have. Your involvement and practical help is what moves us forward.

I find it incredible that few people in engineering circles have heard of us. Why is that? Do we promote WES as a matter of course in all our communications? Do we wear our WES badges? Do we promote WES as well as engineering? Tell me!

Milada Williams

Pat

president@wes.org.uk
MentorSET – unlocking women’s potential

Jacqui Hogan, MentorSET Manager, describes recent progress and plans for the future

FOR THOSE NOT FAMILIAR with MentorSET, this is the WES’ flagship scheme to connect women in science, engineering and technology with independent mentors. A mentor can inspire you, enable you to believe in yourself and help you to achieve your goals and ambitions. We currently have over 550 members.

We would like to invite all WES members to join as mentees or mentors (or both). You don’t need to have many years of experience to be a mentor, as we have a number of mentees at the start of their career. Neither do you need previous experience as we give training and support. Being a mentor can improve your leadership skills and enable you to learn much from alternative approaches and different ways of thinking. It can be challenging, inspiring and enlightening.

It’s been a busy year for MentorSET. We’ve run mentoring and leadership training workshops in London, Cambridge, Bristol and Uxbridge, supported by AWiSE, WTS, IET, Cambridge and Brunel Universities. AWiSE has been especially generous in their support, enabling us to offer free places and membership. These workshops focus on the benefits of mentoring women in STEM careers, explain about mentoring and provide an opportunity to practise being a mentor and mentee. We’ve increased membership by more than 10%, resulting in many more matched mentees and mentors. We have created a LinkedIn community to enable members to stay in touch, exchange ideas and compare their experiences. We now also own the trademark for MentorSET.

It’s not been without challenges however. Having lost our government funding earlier this year, we have been busy pursuing alternative sponsorship opportunities with a professional fundraiser. We have started discussions about running a mentoring training programme or implementing a mentoring programme with other organisations. Neither do you need previous experience as we give training and support. Being a mentor can improve your leadership skills and enable you to learn much from alternative approaches and different ways of thinking. It can be challenging, inspiring and enlightening.

We ran a survey of MentorSET members and the feedback we got included:

“A really valuable programme, it complements WES”

“One of the best things WES does”

“Getting women off the round-about and onto the escalator”

“Recognises the difference of women in STEM (problem solving, systematic approach, the a word)”

“Cross sector mentoring – broadens peoples perspective”.

Going forward, we have plans to grow the scheme, look at improving the matching process, run webcasts and implement an e-learning module to support MentorSET members (short term) and for all women’s career development in STEM (longer term). Having revamped the main marketing leaflet, we also plan to produce a leaflet explaining the benefits to employers of mentoring women in STEM careers via MentorSET.

For more information about the scheme, and how to join, please go to www.mentorset.org.uk.

Hard work, good fun and inspiring

ICWES15 was never going to be an easy conference to get to, but finally over 500 people from 40 countries (including some WES members) came to Adelaide in Australia.

Adelaide is a lovely city of wide streets and colonial style buildings, and although we were there in the winter, the weather was mostly sunny and pleasant. The Conference Centre was well equipped and very handy for the hotels. There was a good sized Exhibition Hall and this was the general meeting point where we had our breaks and viewed the company stands and poster presentations.

Conference began with an excellent presentation from Jocelyn Bell-Burnell, well-known to us in the UK and who was, at the time, President of the Institute of Physics, and also one from Mrs Maria Preto-Laffargue, the President of the World Federation of Engineering Institutes. Conference was well supported by Australian industry and commerce, and many Australian women engineers and scientists attended. In addition, we had a good attendance from Nigeria, Korea, Japan, New Zealand, United States and UK. The organisations had tried hard to raise money for delegates from developing countries, and this had helped to get more people there.

There were also good social events including a reception from the Governor of South Australia, a welcome cocktail party, and a gala dinner during which women members of Engineers Australia modelled work clothes and safety garments designed for women! As always, it was a very friendly conference, and many people made friends with those from different countries. In my opening address as INWES President, I asked delegates to try to make friends with at least one person from another continent – if at least a few did this it would be a great thing for world understanding.

In addition to the main conference, INWES held two Board Meetings, and its AGM. You can see who has been voted onto the INWES Board on its website at www.inwes.org. It was good to see that Pam Wain, Margaret Ajbode and Roseni Dearden from WES were voted in. I stayed on the Board as Past President. The new Board is very new – there are few people from the last Board left and I am very hopeful that this will bring a fresh outlook into INWES. The new President is Kong-Joo Lee from South Korea who has worked hard for INWES over the past few years including being Chair of ICWES13.

Overall, ICWES was hard work, good fun and ultimately inspiring. I think everyone enjoyed it immensely, and I certainly did. I took the opportunity of spending 3 weeks afterwards touring around a small part of Australia, and was knocked out by the country. It was fantastic. And just as a footnote, if you go in the winter there are no spiders, snakes or flies!
Olympic Park ‘big build’ has helped hundreds of women into construction

AS THE OLYMPIC PARK AND VILLAGE ‘big build’ nears completion, the Olympic Delivery Authority (ODA) has recognised the contribution of over one thousand women who have worked on site to help deliver the project on time and within budget.

The ODA’s award-winning ‘Women into Construction’ project, established before construction started in 2008, has successfully helped women access training and employment opportunities on the Olympic Park. The project recruited and placed 266 women directly into jobs with Olympic Park contractors across all trades including electricians, bricklayers, carpenters, traffic marshals, engineers, plumbers, dumper-truck drivers, security guards and signallers.

In total 877 women have worked on the Olympic Park and 166 women have worked on the Olympic Village since construction started. The ‘Women into Construction’ project has arranged over 362 training opportunities and provided employment support, including one-to-one mentoring to 580 women. Through suppliers and subcontractors many more women across the UK will have gained employment and training helping to deliver the venues and infrastructure for the Games.

ODA Head of Equality, Inclusion, Employment and Skills, Loraine Martins said:

“We’re on track and firmly focused on the finish line and it’s important to recognise the contribution made by the women. Women are traditionally under-represented in construction, limiting their opportunities to interesting and satisfying career opportunities and diminishing the industry’s access to wider range of talent and skills. Through the ‘Women into Construction’ project, we have demonstrated that women can be attracted, trained and recruited into construction careers.”

Chair of the London Assembly Jennette Arnold, said: “The Women into Construction team have created a template for the construction industry that works. It has been my great privilege to have met so many of the beneficiaries of the project and heard how this opportunity has changed their lives.”

London Development Agency chief executive Lurene Joseph, said:

“This London Development Agency backed project has got hundreds of women into real jobs, helping to build and transform the Olympic Park from a brown-field site into a place that will be at the centre of the world’s attention in 2012. The consistent success of the ‘Women Into Construction’ project is a model that can be followed on other major construction sites.”

Personal experiences

Kerri Chambers, an apprentice bricklayer, said: “Working on the Olympic Park was an amazing experience. I am proud to have been involved. I loved it and of course I learned a lot, mostly about myself and what I can achieve.”

Annamarie Ferguson, an electrical trainee who had been trying to break into construction for three years, and completed her site-based training on the Olympic Park, said: “The Games only come along once in a lifetime and gave me what I needed – a job.”

Angela Benjamin, trained at the ‘digger school’ on the Olympic Park to work on site as a dumper truck driver, said: “I loved working on the London 2012 Games and it’s even more special because I helped build it.”

The ‘Women into Construction’ project was funded by the London Development Agency and Construction Skills. ‘Women into Construction’ and the ODA gender equality programme have been recognised by several awards including: 2009 Women in Science and Engineering Partnership Award; 2010 Opportunity Now: Innovation Award; 2010 First Women: Business of the Year; 2010 Women of the Future: Corporate Award; The Times Top 50 companies for women.

Photo below shows Amirah Gaija, electrical design engineer
Princess Royal presents 2011 WISE awards

THE WINNERS OF THE 2011 WISE Awards were announced on Wednesday 19 October at London’s Institute of Engineering and Technology in the presence of HRH The Princess Royal.

The Women into Science, Engineering and Construction (WISE) Awards, in association with the European Aeronautic Defence and Space Company (EADS), celebrate those who inspire girls and young women into the field of science, technology, engineering and mathematics.

Excellence Award for Female Engineer

Claire Jones, a mechanical project engineer who works at Sellafield, won £1,000 and the WISE Excellence Award, sponsored by Thales UK, for being an inspirational role model for girls and young engineers.

The WISE Excellence Award is open to women working in the early stages of their career who demonstrate a high level of commitment to the profession and to the promotion of science, engineering, technology and construction.

Claire graduated in mechanical engineering at Loughborough University in 2006. In 2009 she set up a young engineer’s panel in West Cumbria to organise events for young members of the Institute of Mechanical Engineers (IMechE). In May 2011, she became Chair of the IMechE Young Members’ Board, representing over 65,000 young engineers worldwide.

As well as promoting STEM careers for young women in her local area, Claire is currently setting up a project with the UN Technical College in the Gaza Strip to help educate female students via e-mail and video conferencing.

Tony Gill, chief executive at Cumbria STEM Centre Ltd, who nominated Claire, said: “As a STEM Ambassador Claire uses her own high level of enthusiasm to show other young women the potential for rewarding and worthwhile careers within STEM based industries.”

Champion Award

The Warwick School in Redhill and the Unlimited Theatre Company in Leeds jointly took the WISE Champion Award, sponsored by the Institution of Engineering and Technology, for their inspirational educational work engaging girls into STEM subjects.

The WISE Champion Award is open to schools, industry, universities, colleges, charities and professional bodies that have taken active steps to address the WISE mission to encourage girls and young women into STEM education and related careers.

Advisor Award

Heather Aspinwall, a curriculum leader in applied science and mathematics at Wirral Metropolitan College, won the Advisor Award. The award, sponsored by Intel Ltd, was open to career advisors, teachers, ambassadors, mentors and educators who have motivated and enthused girls and young women to pursue STEM related subjects. Marianne Hill, from the City of Sunderland College was a noted runner-up for the Advisor Award.

A spokesperson from the EADS Group, said: “EADS is proud to be the headline sponsor of the 2011 WISE Awards, and would like to congratulate all those shortlisted for this year’s awards... supporting gender diversity is a priority of the EADS Group, and the efforts of all who promote STEM studies and careers to the next generation of young women engineers and scientists will help organisations like ourselves meet our objectives to recruit more women into our industries, and ensure equal opportunity for all.

Arup achieves excellence in gender equality

ARUP HAS BEEN awarded an ‘Achieving’ SET Fair Standard Award for excellence in gender equality best practice from the UKRC.

The UKRC’s SET Fair Standard is the gender equality award for businesses and organisations in science, engineering and technology (SET), including the built environment and information technology.

The award was presented at the 2011 WISE Awards evening by HRH The Princess Royal to Dr Alan Bellfield and Mary Clare Race from Arup.

An Arup spokesperson stated, “We are delighted to receive the award “Arup can [now] demonstrate a commitment to developing and promoting all of our people regardless of gender, showing to our clients a commitment to gender equality, and ensuring we attract and retain the best possible talent.”
DELIVERING SAFE, FAST, inclusive and reliable transport to next year’s Olympic Games whilst ensuring the rest of the UK keeps moving were her priorities, said Sue Kershaw, project head of delivery for transport for London 2012. Sue was the keynote speaker who opened the WES 2011 Conference.

The transport infrastructure had been completed on 1 June this year and was now being tested. The Olympic route network would be in place by June 2012 and the Javelin rail service by July 2012. All this had been achieved in partnership with public transport providers and in consultation with the public. She was thrilled at the transformation of the East End that the Games was bringing about and transport was key to this.

The way we travel

Network Rail faced the challenge of achieving 21% efficiency savings whilst increasing performance and productivity over the period 2009-2014, said Andy McIntosh. At present 40% of the network was electrified – electric train running costs were two-thirds of those of diesel trains. Electricity costs were predicted to rise by 50% over the next 15 years, so the challenge was how to reduce power use whilst increasing capacity. The biggest reduction in power take-up could be achieved by regenerative braking. This uses braking to generate power.

Helen Monkhouse of Protean Electric described a unique concept for powering electric cars – motors inside wheels. Each motor has a built-in inverter, control electronics and software. Each motor has two connections: to the battery and to the central system electronic control unit. This unit receives system inputs from the vehicle, such as accelerator and brake pedal positions, and sends control messages to the motors. It is also responsible for monitoring battery status, communicating with other vehicle systems, and for handling fault conditions to maintain safe operation.

Infrastructure and the future

Jo Parker established Watershed Associates in 2004 to help utilities manage their assets. About 40% of a utilities annual expenditure is spent on maintaining and replacing assets, so it’s important and essential to target this expenditure. In addition, for many utilities accessing networks can be costly and disruptive to traffic.

Jo can help with the establishment of

Managed motorways

The Highways Agency is the executive agency for highways in England, explained Jennie Boyd. Jennie develops and reviews standards on the motorways and is involved in the “Managed motorways” pilot scheme. Managed motorways look at reducing congestion at peak times of the day and during the week. It uses methods such as speed reduction and the opening of access to the hard shoulder for all cars at peak times. This system targets the most congested areas on the motorway by detecting traffic levels when they reach a specific part. For instance the speed limit could be reduced from 70mph to 60mph to 50mph whilst also giving hard shoulder access.

Proof of this system working can be seen on a speed flow graph which shows that as there is more traffic the speed goes down showing the full capacity level. With a managed motorway system in place higher volumes of traffic can get through and there is less congestion during these crucial times.

Some of the equipment used within this system are CEC combined equipment combats, ms4 driver information panels, CCTV fixed direction signing, lighting gantries, motorway micas which detects any accidents.

Whilst this system may slightly increase journey time, it does provide environmental benefits like the amount of carbon dioxide emitted whilst on the motorway.

Proud to be the engineering design experts behind London 2012

To make it possible for people to travel to the 2012 Olympic Games 20 km of roads have been built, said Dorte Rich Jorgensen (Atkins Global). Eleven thousand workers cleaned up the site and most material was recycled and used in construction of the Olympic Park, for example, the tyres found were reused for the foundations. Ninety percent of the material used in construction can be reused after the Olympics.

There were more women in this project than any other. The present results prove their slogan “Bring up the best and give the best”.

Noor Ul-Ain (Electronics Engineering student at Reading University)
Startrek Vision

Muna Hamdi’s talk on seamless travel, also known as the ‘Startrek Vision’, was extremely interesting. The possibility of vehicles knowing where they are going with only one command is fantastic, and also manageable. Having intelligent mobility is definitely a step in the right direction for people who travel a lot, as this will make their journeys smoother, more efficient, and also more comfortable, especially if they have to change transport.

Is this a viable vision? Or is it just a good idea? Only time will tell. That is, after everything has been taken into account, such as: social and economic problems and hazards. Also, will it have an impact on the environment.

There is long term and short term planning that needs to be taken into account, all problems need to be ironed out and funding needs to be discussed. Questions like: is it dependable? Will it be reliable? Will it be available worldwide? Will it be safe? All need to be answered before the seamless travel option takes off. Other questions like: is it adaptable? Clean? Efficient? Also need addressing before a decision is made.

All intelligent systems are adaptable and will all help us to move forward into the ‘mobile tech’ generation. However, reliable information is needed, and it needs to be easy to understand for people who will be using the system. There will need to be information centres, like those for other travel systems.

The idea of seamless travel is already closer than we thought possible. The question is are we really ready for this change?

Shauna Coyle (Engineering Diploma student at Newcastle College)

Cycling infrastructure

The cycling infrastructure talk really stood out to me. I’m studying chemistry as a degree so am continuously learning about pollution and the effects on the environment. It was really great to hear from Claire Wright about the work being done by Sustrans to encourage people to cycle. As pollution levels rise and there are worries about us as a country becoming unhealthier, it’s inspiring to hear about a charity working on creating more cycling and walking networks. They really listen to what people want as they have steering groups that consist of local people so they can design the routes specifically towards their requirements.

I don’t cycle as I feel there aren’t enough safe routes so I was really happy to hear that Sustrans are already creating more cycling routes that are separate from the road system and also are linking roads using quieter routes.

Sustrans is really making a huge difference to promote cycling, by benefiting people’s health and contributing to making our country a greener place, it will definitely make a huge impact in the future.

Zoe George (Chemistry student at Leicester University)

Energising girls about engineering

Can you build a stable structure from spaghetti and jelly beans? The group that built the tallest structure that could support a golf ball would win a prize, said Dawn Fitz. Much hilarity followed and there was an eventual winner. This was one of the experiments that she took into schools, Dawn explained.

Dawn is delivery director for the Bloodhound project and her co-presenters of the workshop, Jill Collins and Pat Morton, run the STEM Careers Advisory Service at the UKRC at Sheffield Hallam University. The workshop aimed to inspire those present to volunteer as STEM ambassadors to go into their local

Keen audience attention (above); Jill Collins during the Energising girls about engineering workshop (below)

appropriate performance criteria, the setting up of data bases to collect asset data, the analysis of asset data and the development of asset management plans which incorporate both day-to-day maintenance solutions and major refurbishments and replacements.

Major projects the company has been involved in include Restructuring of the production function at Three Valleys Water and the merger of two water companies.

Under the Crossrail project, a major six year programme is in progress to upgrade Tottenham Court Road underground station where the last major expansion work took place in the 1930s. Emma Bradley from Atkins Global described her company’s work on the Goslett Yard Box – one of the four large boxes to be sunk deep into the ground. Construction of piled diaphragm walls and large plunge columns for the new Goslett Yard Box have already been completed. It will form the Eastern Entrance Hall to the new Crossrail Station.

Royal Mail Logistics consists of three main operating units, Network Operations, Logistics Processing and Fleet and Maintenance Services as well as Facilities Management, said Ian Wilson. All of which employ 8,000 people across the whole of the UK.

Network Operations physically distributes products through its national network of road, rail and air. Logistics Processing handles bulk mail and fulfilment products across 11 sites and operates three Manual Data Entry Centres (MDEC) whilst Fleet and Maintenance Services supplies and maintains 36,000 vehicles, operational equipment and consumables including uniform.
Critical skills for professional advancement

This year was the first year I attended the Women’s Engineering Conference. I had never heard about it before and I was overjoyed that I was able to attend the conference as a bursary student on the behalf of Jaguar Land Rover. Being a Biochemical Engineer and this year’s theme focusing on transport I was not too sure what to expect, however it was an area I’ve always been interested in despite my slightly different career path.

I really enjoyed the Critical skills for professional development workshop, particularly the talk from Laurel Herman on ‘What is gravitas’. She talked about people having a presence and noticing that there is always something interesting about a person. She talked about previous clients that she had and also gave us a few hints and tips to look and feel confident.

Another highlight was speaking to the representatives of Jaguar Land Rover during lunch. They were really keen to understand more about us, why we chose engineering and also why women don’t stay in the field of engineering once they have studied their degree. Just from the short talk I had with them, I was given so much hope, drive and determination to find out more and start applying and thinking more about my future.

Sheun Oshinbolu (University College London, MEng Biochemical Engineering)

Energising girls into engineering (cont)

Schools and inspire girls, and boys, to become engineers. After all the ideas and suggestions shared by the three presenters, there was certainly a buzz of enthusiasm for the second woman to achieve this. Then she would be able to say, “I got there”.

“I have had a great career in industry,” Isobel said. “The UK is still an important manufacturing nation but we are now having problems finding those with the right skills.” Around 31,000 new engineers are needed. As an urgent priority government and industry needs to work together to promote engineering. Industry needs to invest in promotion in schools and changing workplace culture if it is to obtain the engineers it desperately needed.

Isobel congratulated Karen Burt Award winner Gemma Whatling on her work in promoting engineering to schoolgirls. “Gemma has packed so much into her engineering career and has clear-cut ideas for the future,” Isobel said.

Gemma, who was nominated by the IMechE, was presented with her award by Isobel. She described her work on the biomechanical classification of joint function. Her job was to try and understand how arthritis affects the lives of the 8 million people who suffer from this disease in the UK. She uses a biomechanical model to assess patients before and after joint surgery – and provides valuable information for surgeons and physiotherapists. (An interview with Gemma will appear in the next issue.)

Celebrating and acknowledging technical women

In her introduction to this session, Professor Isobel Pollack, IMechE Deputy President, said how much she was looking forward to next May when she would become President – only the second woman to achieve this. Then she would be able to say, “I got there”.

“T have had a great career in industry,” Isobel said. “The UK is still an important manufacturing nation but we are now having problems finding those with the right skills.” Around 31,000 new engineers are needed. As an urgent priority government and industry needs to work together to promote engineering. Industry needs to invest in promotion in schools and changing workplace culture if it is to obtain the engineers it desperately needed.

Karen Burt Award winner Gemma Whatling (centre) with Pip Ayton (chair of selectors), Jan Peters, Cyril Hilsum (Karen’s father) and Isobel Pollack

WES Annual General Meeting

The 92nd WES AGM was held immediately after conference. President Jan Peters explained that it had been a difficult year financially for WES but measures were now in place to remedy the financial situation. Over the past year there had been considerable engagement with companies who wished to attract women engineers – and some were now becoming WES sponsors. She asked members to spread the message about maybe leaving a legacy to WES in their wills. Over the past year it was a generous legacy that had enabled WES to survive.

The following were elected:

WES Officers

President: Milada Williams  Vice Presidents: Sarah Peers, Jackie Longworth
Secretary: Alex Walker  Treasurer: Grazyna Whapshott
Immediate Past President: Jan Peters  Company secretary: Dawn Fitt

Council

Kayley Arthington  Helen Monkhouse  Daniela Romano
Estelle Barrois  Hind Saidani Scott  Lianne Sheppard
Lisa Brown  Sara Tumbull  Anne Wiseman
Ruth Carter  Paola Cuneo  Carol Long  Carol Marsh

Karen Burt Award and一些赞助商

The following were elected:

WES Officers

President: Milada Williams  Vice Presidents: Sarah Peers, Jackie Longworth
Secretary: Alex Walker  Treasurer: Grazyna Whapshott
Immediate Past President: Jan Peters  Company secretary: Dawn Fitt

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Kayley Arthington  Helen Monkhouse  Daniela Romano
Estelle Barrois  Hind Saidani Scott  Lianne Sheppard
Lisa Brown  Sara Tumbull  Anne Wiseman
Ruth Carter  Paola Cuneo  Carol Long  Carol Marsh

Karen Burt Award winner Gemma Whatling (centre) with Pip Ayton (chair of selectors), Jan Peters, Cyril Hilsum (Karen’s father) and Isobel Pollack.

Outgoing President Jan Peters congratulates new President Milada Williams (above); Jan Peters, Estelle Barrois and Alex Walker (left).
Hilda Hewlett Centenary Weekend

Petra Gratton reflects upon the celebrations

THE HILDA HEWLETT Centenary Weekend was organised by the British Women’s Pilot Association (BWPA) and Brooklands Museum on 20-21 August to mark the 100th anniversary of Hilda Hewlett becoming the first female licensed pilot. I was part of the career exhibition promoting the Brunel University degree in Aviation Engineering with Pilot Studies.

Brooklands Museum Trustee, Penelope Keith opened the proceedings. She has a reputation of portraying strong women, which Hilda incontrovertibly was; however, the actress would be far too tall to imitate the slight-features of the woman known as Old Bird. We learned this tit-bit from Gail Hewlett, author of Old Bird: The Irresistible Mrs Hewlett, an inspiring biography of her grandmother-in-law.

It was one of the nicest weekends (weather-wise) in a rather dreary August, so I think everyone else had gone to the beach (or were flying)!

If the Royal Aeronautical Club had been a bit slower with the paperwork (a copy of her certificate, number 122, awarded on the 29 August 1911 hangs on the wall at Brooklands), we could have celebrated the day in term-time, and perhaps seen a few more visitors.

In the exhibition hall, I was competing for attention with a ‘Fly an Airbus’ flight simulator. I adopted the strategy of not making eye contact with the youngsters (aged seven and up) as they entered the room, but allowing them whilst they were still high, on endorphins and adrenaline, on their way out with “So how would you like to do this flying thing for a living? Yes? Well, keep getting good marks in school – particularly maths and science – and you could come study engineering with us AND learn to fly!” I got a few eye smiles from parents.

On the ‘Women in Aviation’ tour we learned that the first woman to fly at Brooklands was around 1908 in a towed-flight from the racetrack’s finishing straight. At this aerodrome Hilda and her business partner, Gustav Blondeau, founded first a flying school and then an aircraft factory. When the First World War called for the first war-birds, women were employed in the aero-industry in their manufacture. However, whilst it was considered acceptable for women to stitch and sew the canvas that covered fuselage and wings, they were not to be trusted with precision machining. When peace came, women were laid-off to make jobs available for the ‘boys’. Women were again recruited to the production line with the outbreak of World War II, but this time they were permitted to carry out the skilled operation of machine- and hand-tools in metal-working tasks. Our guide noted, however, that they were restricted to the factory floor, the bar to the drawing office was not lifted until after the war, and then only to unmarried women.

One of the early female aeronautical engineers was WES member Beatrice Shilling. One of the museum volunteer’s husband had worked for Miss Shilling in the 1960s. She gave him the fright of his life when they flew together.

Having taken off, she had brusquely passed the controls over to him, a novice pilot, without preamble or explanation. He managed to land the aeroplane by the skin of his teeth!

Four speakers from BWPA were excellent – providing a range of experiences, aircrafts and ages. An airline captain regaled us with her experiences, including being part of an all-female crew receiving the hilarious reaction of some of the passengers as they filed off. My favourite speaker was the eldest of the quartet. She had made a point of getting a very good, well-paying job so that she could afford flying lessons, and now takes touring holidays with her flying friends. One of their recent excursions was from Sweden to Spain: two pilots to each aircraft, each flying one leg of the daily journey with an overnight stop in whichever town they landed nearest. Unfortunately, as they were flying the next day, they limited themselves to one glass of wine, so they could hardly paint-the-town-red! I suspect that this was the kind of flying Old Bird would have enjoyed.

In conclusion, it was a very enjoyable event poorly attended. I hope this doesn’t put off Brooklands Museum and the BWPA organising such celebrations – they just need wider publicity.

Pam is first female Master Cutler

SHEFFIELD’S FIRST EVER female Master Cutler Pam Liversidge (OBE DL FREng FIMechE FCGI FRSA), speaking in the Cutler’s Hall, called on Sheffield business and the wider community to encourage the brightest and best young people to become engineers and technologists.

She told members, Free men and guests: “Manufacturing needs to draw on the full range of skills and knowledge to compete successfully in global markets to create growth and wealth. International investors favour regions with a readily available skilled workforce.

“It is encouraging to see the increasing availability of apprenticeships in local manufacturing businesses but we still need to encourage more young people, especially the brightest and the best, to choose careers in engineering and technology.

“We also have to address the challenge of modifying our education system to engage the 50 per cent of young people who do not have academic aspirations.”

Pam Liversidge revealed Sheffield Council had encouraged the Cutlers Company to increase its involvement with schools to ensure young people left with the skills needed by industry.

The Company would be picking up the challenge and saw it as an important project to which Free men could contribute.

She went on to call for a closer and more integrated partnership between local universities, colleges, schools and the private and public sector to create a seamless educational system that allowed young people to gain higher level skills and employment.

“I am optimistic that there is an appetite within our region for such an innovation,” she said.

Pam Liversidge is a Chartered Mechanical Engineer and has enjoyed a highly successful career of almost forty years in heavy industry. She has held many high-ranking positions, including first female President of the IMechE. In the 1999 New Year’s Honours List, Pam was awarded the OBE for her services to the IMechE.
Two of the five recipients of the IET’s Postgraduate Scholarships for 2011 are women.

The scholarships are part of the IET awards and scholarships programme, which provides £200,000 each year to support young people in their engineering and technology studies.

Sandira Gayadeen, Oxford

Sandira is awarded an IET Postgraduate Scholarship of £10,000. The scholarship will assist her research as she works towards her doctorate.

Sandira started her DPhil in Engineering Science at the University of Oxford in October 2010. The title of her thesis is ‘Design of a beam stabilisation control system for diamond light source’. It is expected that she will complete this work in April 2014.

Sandira said: ‘I feel very fortunate to be recognised by the IET. This scholarship will greatly support my research. I am excited to be able to use this opportunity to raise awareness among IET members of my research and to exchange ideas with other engineers and scientists. I hope to continue developing solutions to challenging control problems.’

Charlotte Lacking, Strathclyde

Charlotte is awarded the Hudsons International Research Scholarship. The scholarship consists of £5,000 and is awarded to assist Charlotte with her advanced research work.

Charlotte started her PhD at the University of Strathclyde in October 2009. The title of her thesis is ‘The orbital dynamics of high area-to-mass ratio spacecraft and applications’. She is expected to complete this work in October 2012.

Charlotte said: ‘I am very happy that the IET chose to recognise my work by awarding me this scholarship. It will enable me to further increase the visibility of my research and the technology development project for the de-orbiting device. My dream is to see it successfully launched into orbit on our satellite.’

Employing over 100,000 people and worth over £29bn, the UK is currently the second biggest aerospace manufacturer in the world but is under threat from emerging nations like China. The Aero 2075: Flying into a bright future? report by the Institution of Mechanical Engineers sets out key recommendations to enable the UK to tap into enormous sales. Even in the next 20 years, there are potential sales of 25,000 new aircraft, worth over £2 trillion.

The report highlights the great potential for our aerospace technology, examines technologies to make commercial aircraft more efficient and above all calls for government and industry to:

- Set out a long-term strategic vision for investing in aerospace.
- Establish an Advanced Technologies Aerospace Research Centre.
- Ensure UK plc is an attractive investment location and restore research and development funding to pre-recession levels.

See www.imeche.org/Aero-2075.

Does Europe have a poor record of employing women in engineering jobs?

The answer is yes! Because of this, the government must work to help businesses close the gender gap and appoint more female engineers, argues WES member Teresa Schofield, chair of UK and Republic of Ireland at the Institute of Electrical and Electronic Engineers Women in Engineering group.

The organisation is seeking to increase the number of women working in engineering and to find why so few women are pursuing the career option.

Teresa suggests that some of the reasons are down to the need for a change in attitude towards engineers, a change in work culture and a reassessment of pay levels.

The problem of female representation in engineering was highlighted at the recent first World Engineering Education Flash Week in Lisbon as a global problem.

In China, women make up around 40% of the STEM workforce, whilst the figure for the US is just 24% and in EU countries between 8% and 29%, suggesting in developed countries traditional views of women’s roles still predominate.

The technology could be rolled-out as early as 2018. Once captured, the CO₂ could be used in industrial processes or be safely stored underground.

Dr Tim Fox, Head of Environment at the Institution of Mechanical Engineers said:

“This breakthrough technology works. What we need from government and industry isn’t just vast amounts of funding, but strategic direction of where this technology could fit into the strategy for dealing with climate change.

“Apart from being a vital technology for dealing with difficult to manage emissions like those from aviation and shipping, this technology could also be a vital tool for setting a definitive price for CO₂. This could help provide more investor certainty for companies wanting to invest in big projects like building new power stations, wind farms or factories.”

Latest Developments in Green Technologies

Clemson University researchers have identified a promising new binder material for lithium-ion battery electrodes that could not only boost energy storage, but also eliminate the use of toxic compounds now used to manufacture the components. The binder is a critical component that suspends the silicon or graphite particles that actively interact with the electrolyte to provide battery power.

Known as alginate, the material is extracted from common, fast-growing brown algae. In tests, it has helped boost energy storage and output for both graphite-based and silicon-based electrodes used in existing batteries and silicon-based electrodes being developed for future generations of batteries.

The research is the result of collaboration between scientists and engineers at Clemson University and the Georgia Institute of Technology.

“Making less-expensive batteries that can store more energy and last longer with the help of alginate could provide a large and long-lasting impact on the community,” said Gleb Yushin, an assistant professor in Georgia Technology’s School of Materials Science and Engineering. “These batteries could contribute to building a more energy-efficient economy with extended-range electric cars, as well as cell phones and notebook computers that run longer on battery power – all with environmentally friendly manufacturing technologies.”

A device that can absorb carbon dioxide directly from the air, thousands of times more powerfully than a tree, was showcased at the Institution of Mechanical Engineers’ Air Capture Week in October. The photo above shows what an artificial forest of these devices might look like.
Central Cluster visit the Great Central Railway

On a sunny Saturday afternoon in May, members of the Central Cluster enjoyed a visit to the Leicestershire Great Central Railway.

After looking round the Loughborough GCR station (and meeting Freman Sami), we travelled on the steam train to Leicester North. Here we watched the engine being moved to the other end of the carriages, before riding back to Quorn for a very enjoyable pub lunch.

Memories of Rachel Parsons needed

I am the author of a recently published biography of William Armstrong of Cragside (see http://www.williamarmstrong.info). I am about to embark on a new project – Rachel Mary Parsons (1885-1956) and her circle. Rachel (shown right in her Buick) was the first president of WES. She was descended from a line of prominent engineers. Her father was Sir Charles Parsons, the inventor of the steam turbine.

Her grandfather was William Parsons, 3rd Earl of Rosse, who invented the giant telescope. Rachel helped to run her father’s company on the Tyne during the First World War and later became the first woman to take the Mechanical Sciences tripods at Cambridge – a subject in which women were unable to graduate at the time. She and her mother were deeply involved in the suffragette movement before the war, and Rachel, in parallel with Caroline Haslett, continued to campaign for women’s rights in politics and the workplace.

I am interested in all aspects of Rachel’s life – not least the fact that she met a violent death at the hands of a stableman in her Newmarket racing yard. She never married or had children. Indeed, she was emblematic of her generation of highly talented women who had their hopes and dreams frustrated by virtue of their gender. If any members are able to help me with personal recollections or to direct me towards WES archive material, I should be extremely grateful.

Sally in Uganda

WES member Sally Sudworth has just completed her year as chair of the Institution of Civil Engineers Wales. She is the first woman in this role. The WES Annual Report described Sally’s visit to Uganda as ICE Wales chair together with WES Council member Lianne Shepherd. They were among a group of 15 Engineers for Overseas Development (EFOD) volunteers who helped to finish off the Soroti Medical Centre. EFOD and the Salt-Peter Trust have worked with local people to develop the centre which provides health and dental care. The centre also hopes to help local people by providing training resources. Sally took with her 10 laptops donated by her employer Halcrow for use in the centre.

Sally also visited the Widow’s Co-operative in Koutulai, another EFOD/Salt-Peter Trust initiative. The co-operative provides local women with a grinding mill and access to a borehole for fresh water. She took with her many gifts and scarves donated by Halcrow employees which were greatly appreciated.

Diary 2012

- 18 Jan Mentoring and Leadership workshop (17.30 to 20.00) at Brunel University, Uxbridge. For more details see www.mentorset.org.uk

- Please send all diary items by the next issue deadline: 15 Jan 2012.

- 10 Feb Inspiring Women’s Enterprise in TV at The Greenhouse, MediaCityUK, Salford. One day workshop for women working as freelancers or employees in the TV production industry; women returning to the industry after a career break; women with relevant transferrable skills seeking a career in TV production. Further workshops on 27 February at BBC Bristol and 7 March at Skillset, London. For more details see www.theukrc.org/events.