

The Woman Engineer



The journal will be going exclusively online from Summer 2024.

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From the editor's desk

Anyone who attended the WES Annual Conference will be delighted with the outcome. I know I was incredibly energised by the whole experience. High attendance numbers, a professional and central venue, excellent and thought-provoking presentations and the chance to network in a way that we have not been able to for some time.

Although WES has maintained excellent online events in the past couple of years, there is nothing better than face to face interaction. This was particularly evident during refreshment and lunch breaks and the drinks reception, kindly sponsored by Smiths, on the evening of day one. It seemed that nobody wanted to leave; the chatter and high spirits was palpable. One delegate told me it was one of the best events she had ever been to. The conference certainly highlighted a very serious topic and presenters armed attendees with plenty of advice and tips to enable them to return to their workplaces better informed than before. What stood out was the determination to inspire and champion safe working and an inclusive and secure environment for



Lynn Postle, FICME

everyone. There's nothing quite as empowering as working together for a common aim. Read more about the conference on page 4.

WES is delighted to share news about our new Climate Emergency Group (see opposite) and our new Jobs Board (see page 10).

This issue also has a feature on manufacturing and how to attract more women into senior roles in this sector, with advice from an international law firm. Shared experiences can help us make changes where they are needed.

In the meantime, happy reading and I wish you all a long and lovely summer.

Next issue: Autumn 2023, contribution deadline – 10 July 2023



President's Message

As we face forward into Summer and the turn to Spring has given us some longer evenings, there always seems to be an upsurge in the number of industry events and conferences. No doubt making use of the increased energy and time that Summer somehow enables. With that increase in events there is of course an increase in the dreaded networking!

If, like me, you always worry about networking and concern yourself with who you should try and speak to, what about, and how you might maximise the benefit to you or your role from going to these events: I have a simple piece of advice for you – stop worrying! I can almost guarantee that you may not realise it at the time, but every conversation and touch point will be useful in some way. I have found that sometimes even a very short and jovial conversation, not linked to work, might lead to something. It might spark a thought or create a connection that you did not understand would be useful but later might be transformational. For ages in my early career, I thought there was some skill I needed to be able to network effectively, but the more I have done it, the more I realise it is just about being yourself and engaging openly in conversation. If you do find that it is challenging and not enjoyable, you could be trying too hard to turn it into an exercise with expected outcomes.

So, as you head off to those conferences be open and relax. Do not stress about the networking, enjoy it and you might just surprise yourself with the outcomes!

Dawn Childs DBE FREng

don't miss

International Women in Engineering Day
23 June 2023 – Globally
www.inwed.org.uk

Check the WES website for events and updates at:
www.wes.org.uk/events/wes-events



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Utilising the power of WES to tackle the climate emergency



It is without a doubt that we all need to work together to create a sustainable future. WES highlighted this in the 2020 Top 50 Women in Engineering (WE50) awards. Through this we celebrated and showcased the great work of women in engineering in the field of sustainability elevating the topic to a wider audience.

Pictured above: Chair of WES Climate Emergency Group, Paula McMahon CMgr FCI CEng FICE FWES

The then WE50 Head Judge, Sally Sudworth, presented the case for a WES Climate Emergency Group (CEG) to the Trustee Board and the group was set up. As the Founding Chair, Sally led the group to put on several webinars and the group was part of a panel event at COP26 in Glasgow. In March this year, Sally handed over the reins to Paula McMahon who believes the group can build upon their past successes.

The group is made up of a very wide range of people who stretch across many disciplines and sectors. As new Chair Paula believes, the group's main asset is the knowledge and passion of its current and future members.

Paula is hopeful for the future as the members have already contributed with new and exciting plans. They have identified that much effort has to date been spent on encouraging individuals to make personal changes. Whilst this is important, the group acknowledges on its own this 'bottom-up approach' will not tackle the climate crisis.

The group has focused on meaningful and timely action and has wholeheartedly got behind an Open Letter idea to encourage a top-down approach from the UK Government and policy makers. At the time of writing the Open Letter Lead, Brogan MacDonald, was working with the whole group and the WES Board to maximise the opportunity to create consistent and meaningful climate action.

Paula believes by working together to raise the profile of the climate emergency

By utilising our collective potential, we exceed what each person can do on their own.

through the promotion of the work and ideas of WES Members through WESCEG channels we really can change the world. Group discussions have led to some fantastic ideas to ensure that WES lead by example and there are plans for proposals for the WES Board to consider.

Member numbers have increased as WESCEG has welcomed some new members and welcomed back some more established ones. Group members attended the *WES Annual Conference* to inspire the audience to accelerate change through personal and professional actions in an interactive workshop. Also, Paula presented her Primary Voices initiative to demonstrate how everyone is part of the solution to promote positive climate action.

Paula believes WESCEG can make a real and significant difference to its Members, WES and beyond. By utilising our collective potential, we exceed what each person can do on their own. All WES Members are welcome to join the diverse and passionate group, feel free to get in touch with Paula at CEGChair@wes.org.uk to find out what you can do to help.

SAFETY AND SECURITY takes centre stage



“It’s such a good time to be an engineer”, keynote speaker Alison Baptiste CBE effused to an audience of enthusiastic participants at this year’s WES Annual Conference. “We need brilliant thinkers and problem solvers now with the many challenges we have – energy crisis, global climate change, need for economic growth and more entrepreneurship. As an engineer, we have never been needed more.”

Recognising that those present would be contributing to the solutions to the challenges she referred to, she reassuringly said: “You are in the right place and doing the right thing as WES Members – you’re investing in your future and your career.”

With an impressive career under her belt and holding the post of Director of Public and Security Services, Infrastructure and Projects Authority in the Cabinet Office, Alison Baptiste is a keen advocate for engineering and encouraging the next generation into the profession.

Pointing to “inspiration, innovation and far-sightedness”, she urged those present to consider those three things throughout their careers.

Inspiration, she said is not just a feeling of being able to “conquer the world” but is often found in more testing situations. “Inspiration can come when you feel alone and need to ‘dig deep’ or it can come in a random way when you think you’ve failed at a project, but then you see a way through. Failure often brings about new possibilities.”

She encouraged attendees to spread the love of the profession to raise awareness. “I try and start sentences with ‘as an engineer, I’. This enables me to keep spelling out the message.”

In terms of innovation, she said it is often not about “the new”, but about “tweaking what we already have, rethinking things for a new use,” whilst, far-sightedness she said is: “the ability to think about the future, scenario planning. Thinking about how things work for you and your career.”

She gave a detailed account of her own career path, highlighting how the “impact on society” is what has “really driven” her. Picking up the theme of the conference, she said: “safety and security can be nebulous terms, but they are fundamental to everything that we do.” With her role covering national security matters, she considered the role of engineers in government and spoke of a “systems approach” that thinks about the natural environment, built environment and services and how they work together.

Communicating to the wider world

She also spoke of the so-called “softer skills” and understanding how technology helps people. “It’s about explaining the technical stuff clearly but putting yourself in the shoes of the users and being able to think about their experience. Basically, the bridge between

engineers and non-engineers. We need to be able to communicate the value to people.”

Echoing her thoughts, WES CEO Elizabeth Donnelly said: “Systems thinking literally changed my life. It’s about seeing how things affect people and communities.”

Primary voices accelerating planet security

Educator and self-confessed Lottie Doll collector, Paula McMahon, Co-Chair SRM Gender Equality Network, Sir Robert McAlpine and Chair of the WES Climate Emergency Group warned: “We are not doing enough, or quick enough, for planetary security.”

She explained that by using the UN Sustainable Development Goals as “a handbook to live our lives by” we could be living “a happier life with more interaction and a better outlook for the climate.” She said: “We should be focused on these goals and retrofitting projects back into them.

“I set up Primary Voices to educate people about the UN’s Sustainable Development Goals in whatever way is meaningful to them. That is very important.”

Set up as an online campaign, Primary Voices has trained 28 predominantly female STEM educators globally who use “plain language” to provide key facts and demonstrate how everyone is part of the solution to the climate crisis. To date, the campaign has reached 15,000 students with 150+ events.

“Everyone has something they can contribute to be an educator and do something about it,” she advocated.

“We feel, sad, mad and bad about the situation. Children and adults are worried. We are all contributing to the situation, so there’s no point feeling bad about it, just do ‘stuff’ to make it better. I’m encouraging people to use their voices to shift the mindset. Use your voice clearly and kindly and with actions that people can actually do!”

She urged those present to make their workplaces more accessible to more people and to have dialogue with those who disagree. “You need to do this to push issues,” she said. Leaving the audience with the parting warning: “If you’re not terrified, you’re not educated enough. This (climate crisis) is going to be in all our lifetimes.”

In an extensive Q&A, the spirited and compelling McMahon reminded delegates not to become too anxious about the situation. “It is worth challenging all the greenwashing, but don’t let it get to you. Think about what will enact change. You’ve only got so much energy and time. It’s all to do with effectiveness. Do something that makes you think straight and that lets you be effective. Action makes you feel better.”

Defining the line for personal safety

Back to the podium, Paula McMahon stepped up for her second presentation, this time considering those things that we are subjected to that can be defined as 'over the line'.

As another social media campaign #TheLine considers things that are inappropriate and questions: "is this over the line?" to enable users to call out certain behaviour. McMahon said: "Safety is often about how the world makes you feel, this can come down to language. Words and nuances do hurt, and they chip away at your confidence. We need zero tolerance for discriminatory banter. It must be addressed head on."

Panel Session – AI a problematic positive

During a dedicated sponsor's panel session on day one, several topics were discussed around how to improve the planet, such as students' preparation for the workplace and retaining women in engineering roles.

Of particular debate was the concern surrounding artificial intelligence (AI), which is offering positives for many industries but is also shrouded in worry with regards safety and security.

Becki Savin of Ingersoll Rand explained their corporate position. "As a production manufacturer, we are moving into computer sciences, the Internet of Things (IoT) etc. and we need data scientists to work with us on that as there will be cyber security issues that we need to learn about. Our intention is to recruit more data scientists to manage and maintain our machines and to provide service solutions. It will be the passion of young people who will question what we are doing so that we can design more sustainable products."

Sarah Brougham of Safran Landing Systems warned: "We have to be aware of biases that might be in AI in recruitment." Chair Vince Pizzoni, Associate Professor, Chemical and Environmental Engineering, University of Nottingham, concurred: "now video interviews are being used, how do you know if AI has created the criteria being looked at?"

Patricia Ashman, School of Future Transport, Coventry University, said: "We are tackling two things – the impact of tools such as Chat GPT on our students' ability to learn, as it can write applications/CVs etc. and DeepTake, which can be used to bypass filter tools.



Lottie Dolls made appearances at the WES Annual Conference 2023

"Data security is an issue that our students are learning about and how this generative data AI can be used to exploit people, especially women. We have to constantly update linguistic filters to ensure people aren't listening to AI tools to exploit vulnerable people."

Caroline Roche of Capula explained there is a need to get up to speed with AI. "In practical terms we need more investigation as AI could create security issues and we have a dedicated cyber security team working on this."

Cyber Security

Fabio Morais and WES Fellow Dr Manisha Morais of the Kuzuko Group led delegates through some of the cyber security concerns now that we are all living in a world that relies on digital technology.

Fabio Morais presented detailed case studies of cyber-attacks and hacking and warned that social media is the first port of call for cyber criminals keen to gain access to victims' personal details. "They will concentrate on reconnaissance, images with detailed information etc.," he warned. "Social media gives good clues to your passwords etc." He went on to concentrate on one of the most common types of security breaches – social engineering, for example when a colleague asks for your credentials. He also explained the differences between phishing and whaling. Whaling being a form of phishing that targets more senior employees, as they usually have access to everything at the company. "A lot of CEOs also bypass their own security, so if you get their access, you are usually in," he said.

He explained the breakdown of data breaches as: 45 per cent, hacking; 25 per cent, human error; 18 per cent, social engineering; 8 per cent, malware; 4 per cent, physical. He then went on to question: "How safe is your password?" Reminding attendees that generally a minimum of twelve characters is required now, rather than six or eight, and he tabled strength levels of passwords against the time it would take a computer programmer to hack them. Worryingly, many could be hacked instantly or certainly within minutes or hours. The safest being twelve characters, with at least one uppercase letter, plus number, plus symbol.

He highlighted the deep web; Netflix, medical, academia etc. (90 per cent) and dark web; criminal activities, human rights, activists, whistleblowing (six per cent).

He said: "The Internet of Things (IoT) is playing a huge part in cybercrime. Companies get hacked through all sorts of items such as security cameras, Alexa, Ring doorbell etc., anything that is connected to the internet. Attacks on IoT devices increased over five hundred per cent between 2016 and 2017. Cybercrime cost US\$4 trillion globally in 2020 and is growing fifteen per cent year on year." Soberingly, he said: "Forty per cent of businesses that get hacked stop trading and on average only five per cent of corporate data is properly protected."

He explained that the problem was insurmountable, but that companies could make it harder for criminals and could take back some control. "If someone wants to hack into your system they will, it's just a matter of time, but you can reduce the risk in some projects. Just look at things that you can protect and concentrate on that.

His advice:

- Appoint a chief information security officer to drive response to cyber-risk.
- Raise awareness and constantly educate employees. "That's a big way of protecting your business," he said.
- Your supply chain has access to your network so look at them. If they get hacked, your data is vulnerable. Check the ISO 27001 information security standard for cyber security.
- Apply all software updates as soon as they are available and run regular anti-virus scans. Enforce multi-factor authentication and use strong passwords. He enthused: "Two factor authentication is pretty much a game changer."
- Make passwords unique and without personal data – use random words in random order.

The struggle of ethical engineering in the competitive aerospace industry

Dr Tosha Nembhard, Engineering Programme Director, University of Leicester, said a few things get in the way of ethical engineering and that everyone has a personal struggle with ethics. "We all have our unconscious biases and lived experiences and that's okay, just recognise it," she said.



Continued over.....



She emphasised the importance of responsibility, especially when there is pressure to align or beat a competitor, with a video about the Boeing 737 aeroplane upgrade that resulted in catastrophe and loss of lives.

“In product design, there is a lot of pressure from seniors but your responsibility as a product engineer is to the user. Find your place, then fight the ethical battles. Re-design requirements have changed and we need to look at technology readiness requirements.

“We need to consider ethical decision making. Is meeting the deadline or satisfying the customer more important than the ethics? There is a pressure to ‘behave’ accordingly for career progression. The business case may be driving the conversation rather than the ethics.”

She explained how to tackle such a dilemma. “You are responsible for your job, the design etc. If things go wrong, your employer or the customer will come back and say: ‘you signed it off’, they won’t say: ‘we put you under pressure to do so’, so escalate your concerns to directors and ensure you are heard. Also, network internally and externally, this will act as sounding boards, and join societies and engineering groups like WES for support and guidance.

“When you’ve tried everything and things still haven’t changed, it’s time to move on. We can only change what is in our control, walking away is a sign of strength.”

Picking up on this important message, Elizabeth Donnelly said: “Often people don’t leave jobs, they leave managers. Make sure you’ve got your backing and ask the difficult questions.”

Delegates were advised to think about how they present their opinions, identify what is wrong and understand that the matter is their responsibility. “Know you have support, we don’t do that well in engineering,” Elizabeth Donnelly said. “We need to look after ourselves, reach out and network.”

Passing on the passion

Following a thought-provoking day, Dr Ama Frimpong, Head of Product Development at 52 North Health and Sarah Dragoiu, Group Product Owner at Jaguar Land Rover were tasked with providing the final two presentations and closing day one of the conference. They did not disappoint.

Dr Frimpong, this year’s *IET Young Woman Engineer of the Year*, manages 52 North Health’s engineering teams in the development of NeutroCheck®, a low-cost, portable device that helps identify people living with cancer who are at risk of neutropenic sepsis – a life-threatening medical emergency occurring in immunosuppressed chemotherapy patients.

Focussing on patient safety in medical engineering, Dr Frimpong said the challenge is to:

“reduce the risk and errors to learn from past events and improve for the future.”

Working intently to get products to market, she said: “If we can create innovative, sustainable products, we are extending safety beyond the current situation and can prevent people from going into hospital.”

Providing equipment and technology that “empowers the patient”, but that is used in their own home, raises its own cyber and data security issues. She explained how protection of patient data on mobile devices was vital.

Although working hard to get the product to market by 2024, Dr Frimpong said data security was as important as the physical welfare of patients. In developing an App to run alongside the equipment, she said: “We need to make sure that the data traffic from a patient’s device and the App is safe and secure. It is a matter of trust. We also need to ensure that the App doesn’t take more data than it needs, we don’t want to create a security risk where we don’t need to.”

Collection of data is also a concern for Sarah Dragoiu at Jaguar Land Rover, working in vehicle safety assisted and automated driving systems. “We deliver a lot of products,” she said. “JLR is passionate about active safety – cameras, radars, ultrasonic sensors.” She outlined how the development of ever-more automated control systems required increasing reliance on collecting and assimilating data. The evolution of the electric vehicles and the development of JLR’s AAD domain controller, which takes data and “acts as a brain,” is the latest move towards automation.

“We are in a virtual world and existing software applications for the AAD domain control module – virtual vehicle and sensor models. We extract data from the virtual to AAD, then use real or simulator controllers. Electronic control modules create a vehicle dynamics model, then we have a test strategy to test across all levels,” she said. “From 2025 we are partnered with AI leaders NVIDIA – architected for safety with new sensing and AI.”

Day one of the conference closed with a drinks reception and more networking between delegates, the exhibiting companies and presenters.

Day two presenters were: Dr Emma Taylor, RAEng Visiting Professor in Digital Safety and Security, Cranfield University; Kerry Evans, EcoScope; Anni Feng, Arup; Amy Sandro, Principle Associate, Eversheds Sutherland; and Elizabeth Donnelly, WES CEO.

WES Annual Conference

27 and 28 April 2023 – Millennium Point, Birmingham

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WES would like to thank all our sponsors, our speakers and attendees for their support.

Engineering and technology trailblazers shortlisted ahead of Engineering Talent Awards 2023

The shortlist for the annual Engineering Talent Awards has been released and sees big nominations for corporate leaders including Wessex Water, Jaguar Land Rover, Airbus and Rolls-Royce.

The national event, taking place in London on 8 September, recognises people with a track record of breaking down barriers to succeed in the engineering and technology sectors and celebrates the organisations with a track record of promoting diversity in the workplace.

BAE Systems, Foster + Partners and Jacobs and are among some of the biggest organisations nominated for awards, with all of them in the running for their employee network groups. Meanwhile, National Grid and UCL are both shortlisted for their workplace inclusion programmes which work towards improving diversity across the organisations.

Students from some of the UK's biggest universities and recent graduates have also been shortlisted for awards. Universities represented in this year's shortlist include Dundee, Lancaster, Leicester, Manchester, and Sheffield.

Dr Mark McBride-Wright, founder of the Engineering Talent Awards, said: "There are some fantastic role models in the engineering and technology sectors working across the UK and so the Engineering Talent Awards rightly shine a light on their successes and ingenuity.

"This is our fourth year running the ETAs and past finalists and winners have already gone on to achieve even more incredible things with the elevation this platform has given them.

"This year, we are looking forward to celebrating the finalists from a range of diverse backgrounds. These awards are a major recognition of the country's finest and emerging engineering talent." The full shortlist and tickets for the ceremony are available at www.engineeringtalentawards.com



Winners from a previous year

EngineeringUK puts spotlight on sustainability

To celebrate Earth Day 2023 on 22 April, EngineeringUK published a webinar exploring how environmental sustainability can inspire young people into engineering and technology careers.

Hosted on the Tomorrow's Engineers website, the webinar was designed to support anyone designing and delivering STEM engagement activities for young people of secondary school age. Led by EngineeringUK's Head of Environmental Sustainability, Mike Hardisty, it showcased why and how environmental sustainability can be used to inspire more young people to consider a career in engineering.

Mike Hardisty explains: "Research shows that young people care about the environment, and many even suffer from 'eco-anxiety'. At the same time young people often aren't aware of the connection between climate change and engineering solutions and, as a result, may be missing out on considering a career in engineering.

"Putting environmental sustainability at the heart of STEM engagement programmes and showcasing the central role engineers have in achieving Net Zero, has the potential to inspire more young people to pursue a career in the sector. We encourage the engineering community to check out the guidance and careers resources we have developed to support them with their outreach activities and to inform young people about green careers."

EngineeringUK has also shared information about its own environmental sustainability commitments, including publishing its Environmental Sustainability Policy – which details its commitment to measuring, reporting and reducing all environmental impacts.

Health and beauty brand highlights importance of STEM role models

L'Oréal has released survey findings explaining why gender inequality in STEM remains a critical challenge. The new survey, conducted by YouGov, identified that girls experience a drop in confidence in science and maths subjects aged 11 to 13 years: a trend not seen in boys. In addition, only 23 per cent of girls in school Years 6 to 8 say that science and maths "comes naturally" to them.

Alongside seeing this confidence drop as girls embark on secondary education – and despite showing a strong interest in science (85 per cent in Years 6 and 7) – as they progress through secondary school their engagement and love for science and maths subjects declines by nearly half: 44 per cent Year 6 to 23 per cent Year 10). This sharp decline comes at a critical age when young students are about to choose GCSE subjects – seeing girls face their first hurdle into STEM education and careers as early as eleven years old.

Role Models

The insights also shed new light on what can help to encourage confidence in girls. It is widely accepted that well-known figures or celebrities can act as role models for young people, but for science and maths, the L'Oréal survey findings show that when girls have real life or relatable role models their confidence in science and maths subjects is much higher. In Years 6 to 8, girls who know an adult who works in a science or maths related job are 75 per cent more likely to be confident in studying science than those who don't.

Fear of Judgement

Case study interviews revealed that fear of judgement can also be a factor. Female student, Year 9: "You think you've got the answer, but then you don't want to put your hand up... you think you'll get judged for saying the wrong answer."

Committed to STEM

As a company founded by a scientist over one hundred years ago, L'Oréal says it is committed to supporting a strong talent pipeline of women in STEM and recognises the vital importance of women being part of solving the challenges of tomorrow. L'Oréal has supported women in STEM for over 25 years through the L'Oréal-UNESCO For Women In Science partnership, which offers Fellowships to encourage the contribution of women pursuing their STEM research careers.

All figures, unless otherwise stated, are from YouGov Plc.



Getting more **WOMEN INTO MANUFACTURING**: what can we learn from a lawyer?

.....
Lucy Pringle, partner at international law firm Womble Bond Dickinson, shares how lessons learnt on supporting the progression of women in law can transfer to manufacturing

What do manufacturing and law have in common? Both are traditionally male dominated work environments, which increasingly attract women into their industries at entry level but have not seen the same pace of change in terms of women reaching senior leadership roles.

I have been a manufacturing lawyer for fifteen years and love working with manufacturing businesses. The people in the sector are a pleasure to work with – friendly, very smart and collaborative. Those clients are also almost uniformly male. I have always felt welcome, and contrary to stereotypes, have experienced a distinct lack of macho-culture. This experience has shown me that a career in the manufacturing industry has so much to offer women. There are many efforts to improve the numbers of women in STEM and I've been delighted to see the numbers of women at industry events increase year on year, but there is huge progress still to be made.

The skills gap in manufacturing is well-documented. Businesses which fail to appeal to 50 per cent of the population are missing a huge pool of talent that can help to address that gap. In the legal profession we have seen that simply hoping for change does not alter the status quo. Despite the majority of law graduates entering the profession being female for many years, improvements in the gender balance at the top of law firms proved to be glacial until targeted action was implemented. Businesses need to take concrete steps to change the way women experience their workplace to attract, retain and promote women. And the good news is that most of the changes don't cost a penny – very lean!

What can be learnt from a law firm?

I recently set up and now co-chair Womble Bond Dickinson's women's network, which has given me a wealth of exposure to what women need to thrive in the workplace. We don't have all the answers (and the answers we've found won't be relevant to all women) but here are some of the key things we have learnt that can be transferred into other businesses.

1. Consider setting up a women's network.

You may think it is not appropriate for a male leadership team to set up a women's network, but be aware that women may have concerns about how a women's network would be perceived in a male dominated environment, and therefore may not suggest it themselves. To avoid any risk of it being perceived as a 'trade union for women', the mandate has to come from the top. Give specific authority for a network, ask them to report regularly to the board, be vocal in your encouragement of their initiatives and implement recommendations they make where possible. Lastly, value and reward the contribution they make in this regard. Effecting cultural change takes

an enormous amount of time, energy and motivation, so it needs to be recognised as 'real work'.

2. **Role models are a must.** There is definitely truth in the saying: "You can't be what you can't see", so a business needs to identify and showcase female role models (at all levels and in all departments). Many women are not comfortable about being put on a pedestal, and few would self-declare as a role model, so this may take some encouragement!
3. **Find and remove barriers.** Women can experience systemic barriers in the workplace that men do not experience to the same degree, and also self-imposed barriers that show up more frequently in female personality traits. Examples of systemic barriers include taking time out of the business on maternity leave which impedes career progression, a long-hours culture being incompatible with caring responsibilities, and only making the highest profile projects available to full-time workers. Self-imposed barriers could include women waiting for gaps in conversations to speak up in meetings (those gaps may never come, so they never say anything), discounting themselves from the next step up the career ladder and not being comfortable with self-promotion. It is unrealistic to expect men to be able to identify barriers which women experience, so women need to be asked about what issues they face (and that's where having a women's network can be handy!). Targeted measures and tailored training initiatives can then be implemented. There will be traits identified that apply to men too – which gives an opportunity to upskill all members of the team.
4. **Ask women to apply for promotions.** It is commonly accepted that women tend to wait until they are one hundred per cent ready for a promotion, whereas men are willing to give it a go before they are hitting all the performance standards. Therefore, businesses need to pro-actively encourage women to apply for promotions. Tell them they're ready, go the extra mile to communicate what the job will involve to alleviate any concerns they may have, and ask what barriers there are to them applying. Women can be more risk averse than men and may need more information to take decisions. If possible, be transparent on the salary associated with promotion so they can assess whether it's worth the extra work.
5. **Build women into succession planning.** The age profile of leadership teams in the manufacturing sector often gives rise to succession challenges.

Lucy Pringle is a Partner in the manufacturing sector group at international law firm Womble Bond Dickinson. Based in the firm's London office, she specialises in commercial law and has a wealth of international trade experience, advising businesses of all sizes on supply chain contracts and global routes to market. Pringle has been a manufacturing lawyer for fifteen years with a passion for the sector and she is an advocate for women in STEM.

Identify promising women and align them to leaders who are coming to the end of their careers. It is no good hoping that a woman will be in a position to apply for a top job at the time it becomes available – businesses need to allow between two and ten years to give a female colleague time to build up the portfolio of skills and experience required to ensure she is the best placed candidate for that job when it becomes vacant.

6. **Be a 'Rock Star Sponsor'.** Senior men and women can play an invaluable role as mentor and sponsor for junior female colleagues. As well as sharing guidance and offering them access to opportunities, a Rock Star Sponsor will talk up a female mentee to the leadership team, raise her visibility and lobby for her promotion when appropriate. This catalyst for female career advancement cannot be underestimated.
7. **Build diversity into candidate pools.** We have recently adopted the 'Mansfield Rule' at Womble Bond Dickinson, which is a scheme for law firms requiring that candidate pools for senior roles must be at least 30 per cent diverse. There is no obligation to select a female candidate for the job, but by simply ensuring that a business's candidate pools include women, they challenge themselves to start with the best pool of talent and, in turn, help expose women to opportunities and help build their internal profile and CV.
8. **Beware the part-time penalty.** More women than men work part-time, and this is one of the major factors which limits the number of women aspiring to top jobs. Many women simply assume that senior roles are not open to part-time workers. Be explicit that part-time applicants are encouraged to apply for all roles. Support those who work part-time – for example don't use pejorative language about part-time working (e.g. "she only works part time"), and don't count part-time workers out of opportunities on the assumption that they will not want to take on extra responsibilities.
9. **Level the playing field.** By supporting men to adopt working practices which are typically associated with women, a business can help to remove stigma and create a more equal workplace in which women will feel supported. For example, if men are taking shared parental leave and working part-time, seek their permission to make this widely known in the organisation. If men are prepared to say: "I can't do a meeting at 5.30pm because it's my turn to pick the kids up" then that does all other carers a huge favour.
10. **Avoid any perception of a 'boys club'.** If the senior management of an organisation is predominantly male, be conscious of where and when decision-making and influencing takes place. Most management teams would be horrified to think that they were inadvertently leaving senior women out of important discussions. However, if soft power is wielded in the pub, over a water cooler chat about football or in any other informal forum which tends to be more male dominated, then be conscious of the fact that such behaviour can exclude women from opportunities. It is often in these informal settings where new projects are discussed, someone agrees to make an introduction to a valuable contact or tips on getting a promotion are shared. Include women in those 'clubs'.

Why it's important to take concrete action

Renowned research by McKinsey found that in the United Kingdom, for every ten per cent increase in gender diversity on senior-executive teams, EBIT, earnings before interest and taxes, rose by 3.5 per cent. Women make up only around a quarter of the UK manufacturing workforce. This obviously makes it difficult to find women to promote into senior roles, which makes it all the more important to retain the women a company has and attract new female recruits by making the business the best environment for women to achieve their potential.

Hope is not a strategy – it's time to do things differently. In doing so, it's likely the business will gain a competitive advantage and create a more robust and effective working culture.

New Members

WES welcomes the following new Members:

Osazoduwa Agboneni, Esther Anderson, Feena Arey, Azucena Ascencio-Cabral, Abbie Aspery-Russell, Kacyan Bartley, Charlotte Bleasdale, Sam Bryant, Molly Clark, Maimouna Diouf, Amber Douglas, Freya Durrant, Diana Edwin, Haniyya Ejaz, Iman Ellahi, Omololu Fagbiele, Melanie Gardner, Stephanie Gauthier, Beverley Gibbs, Jennie Harrison, Alice Jackson, Suzanne Jervis, Karen Johnson, Lauren Johnston, Michaela Kaiser, Natalie Lashbrook, Tuesday Lewis, Katherine Lim, Joyce Longtang Daser-Adams, Anna McDowall, Lynne McGinn, Rhiannon McLaughlin, Jennifer Maher, Mandeep Mann, Saheela Mohammed, Rebecca Morgan, Concepcion Munar Sartorio, Rachel Oates, Elizabeth Olley, Flavia Popescu, Lisa Reading, Amarjot Saggi, Jasmine Salter, Ekaterina Sergeeva, Cora Sheehan, Aqalily Sofiena Binti Zurayusmady, Aayushi Soni, Sandhya Sreekumar, Melanie Stewart, Ella Surman-Wells, Alice Tait, Joanne Turner, Janice Twidale, Charlotte Twigg, Olivia Uchendu, Morag Watt, Helen Welch, Fleur Whitworth, Helena Wilde, Roshna Zangana

Partner News

WES is delighted to welcome our new Partners:

Event Partner: Mercedes AMG High Power Trains.

Company Plus Partner: Gardner Denver.

Company Partners: Manchester Airport Group, Novanta, Legrand, Mettler-Toledo, Lotus Cars, Avove, Electricity North West, Evolito, Capula.

Education Partners: Warwick Business School.

Not for Profit Partners: Wave Energy Scotland.

SME Partners: Marubeni-Komats.

We are also grateful to our renewing Partners which include: Konecranes, AstraZeneca, Edinburgh Napier, Scottish and Southern Energy, Sellafield, Rotork PLC, Kone PLC, Gratte Brothers, Cubic, Reliance Worldwide Company, Thales, Uniper UK, Anthony Best Dynamics, General Dynamics, Durham University, The University of Edinburgh, Heriot Watt University, GKN Automotive.

For Partnership and Sponsorship enquiries, please contact: partners@wes.org.uk

Apprentice Board

The latest updates from the WES Apprentice Board.

The Power of Networking

In February, the Apprentice Board hosted the event 'The Power of Networking' at the National Grid. This event was oversubscribed and was a great success! Female apprentices in engineering from different companies across the UK all came together to attend. The event had various networking activities and talks from inspirational women such as Emma Pepper and Dr Shini Somara. This was the first event hosted by the Apprentice Board and hopefully there are many more to come. The images highlight aspects of the day.



Apprentice Guides

One of our current projects is the *Apprentice Guides*; short information sheets written by our board members using our experiences to provide an insight into different aspects of an apprenticeship. These aim to give some guidance to help reduce the effects of external factors. A few examples of the themes for the guides are stakeholder management, managing work life balance and PPE.

Apprentice Podcast

Following on from the success of our podcast series 'Engineers in Conversation' we are currently working on another series which will focus on different aspects of an apprenticeship. These will be a similar format with discussions between a board member and a guest speaker. Please find the podcast on Spotify using the search: 'Women's Engineering Society Apprentice Podcast'.

Join us and get involved

The Apprentice Board is currently recruiting for new board members! If this sounds like something you'd be interested in please apply using this link, <https://lnkd.in/eeEi74p9>



WES Jobs Board

WES has launched a new Jobs Board.

Job Candidates

The WES Jobs Board is now live on our website and is the perfect place to find your next career move! The new board is easier to search and navigate to narrow down exactly what you are looking for. It will allow you to see details of employers currently recruiting and the jobs on offer. There will also be the option to upload your CV and allow recruiters to search it.

Employers

For employers the new board offers more opportunities for promotion and highlights to assist in your search for an exceptional candidate. View the new board, visit: <https://jobs.wes.org.uk>
To get involved, contact: partners@wes.org.uk

WES Careers Newsletter

We have also recently launched the WES Careers newsletter. This will highlight key jobs coming up, offer careers advice and provide up to date information about the world of work within the engineering industry. To sign up for future editions of the careers newsletter, contact: info@wes.org.uk



Mary Hanley

Tosin Sonubi

Clare James

Rosie Brighty

Personal stories from some of the 30% of the population who are neurodiverse.

Cluster News

Paula McMahon CMgr FCMI CEng FICE FWES reports on an important event held by the WES Tyne and Tees Cluster.

Mentioning the Unmentionable: NEURODIVERSITY

The WES Tyne and Tees Cluster has continued to collaborate with other local institutions to address difficult subjects which affect our STEM workplaces. Their latest online event focused on raising awareness of Neurodiversity as the Cluster felt this was an important topic that we should all be talking about. It is estimated that 30 per cent of the population are now believed to be neurodiverse and there is also a significantly increased diagnosis for girls and women.

The event was planned in the lead up to Neurodiversity Celebration Week (13-19 March 2023). Like other events in the *Mentioning the Unmentionable* series, it concentrated on personal experiences. It was clear that whilst everyone's experiences are unique to themselves, they resonated with many in the audience.

The Cluster was pleased that the event was chaired by an expert, Dr Mary Hanley who is an Associate Professor of Developmental Psychology and Co-Director for the Centre for Neurodiversity and Development at Durham University. Her research has mostly focused on understanding strengths and challenges for neurodiverse groups. Mary gave an interesting overview on how her research has been translated into practice with educational professionals. The online training tool is designed to change understanding of 'Triple-A' challenges at school but can be applied to any environment to reduce difficulties many autistic people experience.

Tosin Sonubi is a data engineer within the financial services sector who graduated with a BEng in Mechanical, Manufacturing Engineering. Tosin always felt unrepresented as a black neurodivergent woman. Her story is inspiring as she found at times this lack of representation made her question her ability and right to take up these spaces.

Clare James started out as a Linux programmer who learned to look after herself studying traditional Chinese medicine which reconnected her mind to her body. Clare now works on ethical engineering standards in AI, helps run women's circles and mentors teachers. Her neurodiversity has allowed her to do several jobs at once, kept her curious and through it she has found compassion in adversity.

Rosie Brighty is formally a primary school teacher who became a mechanical design engineer where she experienced discrimination in the workplace. Rosie realised she was in a position to do something about it and says: "I don't think anyone should have to feel the way I did at work". Rosie is now a training consultant specialising in neurodiversity in the workplace.

Considering the strengths and needs of individuals

All our neurodiverse STEM speakers experienced workplaces which did not make them feel welcome. Each of them suffered a lack of confidence and became self-employed in one form or another. However, retrospective solutions offered by speakers would have been easy to implement. The simple ask to consider the strengths and needs of individuals would in fact improve workplaces for everyone.

The 2023 *International Women's Day* theme of #EmbraceEquity has never felt more relevant!

This webinar is available for all to watch on the *Engineering Together* YouTube channel (<https://www.youtube.com/@engtog>).

For further learning also check out Rosie's website (<https://www.divergent-consulting.co.uk>) and Mary's resource (<https://www.tripleadurham.co.uk>).



#INWED

Share your events to our calendar and tag us on social media so we can celebrate with you!



@INWED1919

Sign up to the newsletter and follow us on Twitter and Instagram to get all our/the INWED news.



SELFIE TIME

Selfie card template now available to download.

For all of the above, visit: www.inwed.org.uk



INTERNATIONAL WOMEN
In ENGINEERING DAY

23 June 2023

#MakeSafetySeen

This year's theme for *International Women in Engineering Day* (23 June 2023) is *Make Safety Seen*.

Brought to you by WES, INWED will celebrate its tenth year in 2023. Resources are available on the website to help with the planning of celebrations including selfie cards, bunting, event suggestions, social posts and more!

#MakeSafetySeen. Women engineers around the world work to keep us safe, wherever we are, whether at work or leisure, at home or online. Following in the footsteps of our first Secretary, Dame Caroline Haslett, who invented the three-pin safety plug to protect children from electric shocks, the 2023 WE50 winners this year will also be women who are protecting the public through their work, often unseen and unknown. They will be announced to celebrate INWED. In addition to the WE50, our INWED events calendar is also filling up with plenty of activities and events that you can join or to help you raise awareness of what you're planning!

Get involved now at www.inwed.org.uk



At just 29, Jennifer MacDonald's passion for engineering has taken her from nose testing whisky to working in the North Sea and being the only woman in an 80-strong offshore oil and gas team in Canada.

Engineer diversifies into a new role to encourage more females into manufacturing

However, it was just over a year ago the chemical engineer landed her dream job as Equality, Diversity and Inclusion (ED&I) project manager with the National Manufacturing Institute Scotland's (NMIS) Manufacturing Skills Academy.

MacDonald wanted to champion the benefits of a diverse workforce and engage the next generation in the wide-ranging career opportunities in manufacturing. And her success in the newly created role has resulted in her being nominated for the University of Strathclyde's *Women in Leadership Network's Inspire* award.

"I moved into this role because I didn't want the status quo as I moved up in my career," MacDonald said. "I wanted to see the industry progress beyond seeing diversity and inclusion as more than just a tick box. My ambition is that we no longer require awareness days to promote women – it should be a given."

Originally from Girvan in Carrick, South Ayrshire, MacDonald first got her taste for a career in engineering and manufacturing while working in a newsagent as a teenager and plucking up the courage to ask a regular customer if she could get some work experience.

"There was a man who came in daily for a newspaper, and I knew he worked at William Grant distillery because of his badge. I had always been fascinated by what went on at the site, so one day, I eventually asked him. It turned out he was the head of laboratories and invited me in for the day. I got the chance to meet lots of engineers, technicians, and scientists, and from there, I got a summer job – one that got me involved in engineering.

"The head of labs also became a great mentor for me. He advised chemical engineering when I asked about what I should study at university, so I started looking into universities. I looked forward to working at William Grant's, but university opened my eyes to the world of opportunities within engineering.

"I undertook different jobs, and my last placement was in Aberdeen when I worked in oil and gas for the first time. I didn't realise how international it was, but immediately after graduating, I flew to Canada, where I lived remotely for three years and worked as a field engineer. I was the only woman out of 30 on land sites and one of 80 on my first offshore rig experience."

Manufacturing the future

MacDonald spent more than six years in the job before joining NMIS which, operated by the University of Strathclyde, is a group of industry-led manufacturing research and development facilities focused on revolutionising skills, productivity, technologies and innovation to make Scotland and the UK a global leader in advanced manufacturing.

"Manufacturing and engineering are so exciting, and it's ever-changing and full of innovation," she said. "NMIS is doing really cool stuff and working with inspiring companies – and all right here in Scotland.

"Coming from a small town in Ayrshire, people think there are only traditional jobs like shipbuilding, but there's so much more. NMIS is an example of how you don't have to move from Scotland to get an exciting long-term professional career. Plus, there are opportunities home and away."

In her role, MacDonald has built an ED&I strategy from the ground up at NMIS and

The National Manufacturing Institute Scotland (NMIS) is a group of industry-led manufacturing R&D, innovation and skills facilities supported by a network of partners across Scotland, all working together to transform the future of manufacturing.

NMIS is operated by the University of Strathclyde. It is supported by the Scottish Government, Scottish Enterprise, Highlands and Island Enterprise, South of Scotland Enterprise, Skills Development Scotland, Renfrewshire Council and the Scottish Funding Council. It is part of the UK's High Value Manufacturing Catapult.

brought ED&I to the forefront of considerations at all levels of research projects. She has already made a name for herself as a leader in her field – regularly speaking at events and on panels, both within NMIS and on a national stage.

An ambassador for STEM, she regularly works with government, industry organisations and the private sector and sits on numerous boards. She has also instigated a wide range of initiatives, including a STEM work experience programme for students in disadvantaged areas involving colleagues from across NMIS centres, along with working on a collaborative research project that supports autism in engineering.

MacDonald's passion is to make the engineering and manufacturing space more inclusive and accessible for the next generation so that more people can benefit from global careers like hers.

"I see myself as a female engineer and want to share my story to encourage others to see the potential in an engineering career. We want to attract more young people into the manufacturing industry by sharing exciting opportunities for everyone."