The Woman Engineer
WOMEN'S ENGINEERING SOCIETY
wes
www.wes.org.uk
SUMMER 2024
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WES VOLUNTEERS WERE BEING RECRUITED AT THE ANNUAL CONFERENCE

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Welcome to the Summer issue of The Woman Engineer

Well, what a cracking start to 2024!

So much positivity, particularly after Conference amongst members. Great excitement was experienced during one of the largest networking events for women engineers within the UK. This issue contains further coverage on the talks and events which took place at Conference, held in Birmingham 17 April 2024.

Entries have now closed for WE50 and I'm certainly looking forward to meeting many of you who are attending the 10th anniversary of INWED on 23 June. We are celebrating with a Big Weekend and if you'd like to take part please visit **www.inwed.org.uk** for further details.

I must say a heartfelt thank you for all the positive feedback and wonderful contributions to the latest and future issues of The Woman Engineer that many of you have provided. It would seem we are hitting the right notes and fulfilling your requirements, as valued members of the society, within the journal.

As always, I look forward to welcoming your feedback and suggestions for topics, articles and features.
Email: **julietl@warnersgroup.co.uk**

All the very best

Juliet Loiselle MInstR
Managing Editor

In this issue:

Dr Katherine Critchley, president of the Women's Engineering Society

Welcome to the Summer 2024 issue

What a fantastic three months it has been since I last welcomed you. From the feedback I have been getting, the revamping of the journal seems to have been well received. It will hopefully go from strength to strength as the editorial board starts to influence its content, ensuring that the articles are on themes that are interesting to our membership.

The Trustees and the WES team have been busy attending events, but the major event of the past quarter was our conference. I always look forward to the annual conference, as a great networking event for the membership. It is also an opportunity to meet with some of the amazing companies that sponsor and choose to have stands. Without our sponsors and supporters, we could not host such a full and engaging conference.

I was honoured to both open and close the conference this year and host the first morning session. We had a great line-up of speakers and panels throughout the conference. Always very thought-provoking, and so inspirational. Once again, I thank the WES staff, Trustees, presenters, and panel members for their support in making the conference the great event it was.

Active in the society

It was also a chance to meet many of you. I had the honour of spending some time with the WES apprentice board, to talk through the strategy and approach to take in planning what they can achieve during their time in office. I am sure they will find the apprentice board rewarding and fulfilling. I would remind everyone that WES is a membership society, and a great way to get involved with WES is through our Clusters, special interest groups, boards and directors' committees. If you need more information on becoming more active in the society then please contact Tristan Holland our Membership Manager at **Tristan.holland@wes.org.uk**

Being invited to the Women Leaders in Electronics Awards 2024, of which WES was proud to be the charity partner, was such an amazing evening, especially seeing so many women leaders in electronics and hearing about the careers of all the award winners and those highly commended. It is humbling to hear about the work that is being achieved. It was also fantastic to meet with a WES Past-President, Jan Peters, who was on a judging panel and presenting an award.

Marking 10 years for WE50

Our next big event is INWED, where the team have been busy planning a Big Weekend to mark 10 years since the first WE50 awards. Having been a recipient of one of these awards, I know what an honour it is, and I look forward to meeting this year's award winners at the afternoon tea. Being in a room with the top 50 women in your field is a fantastic opportunity for those invited to attend, and an opportunity to network and learn more about the great work women are doing in engineering.

WES Annual Conference 2024

K L Critchley

Dr Katherine Critchley
President of the Women's Engineering Society
www.wes.org.uk

Empowering Engineers Symposium 2024 at Durham University

Durham University Women's Engineering Society (WES Durham) was founded in 2021, aiming to inspire, support and bring together those who identify as women and their allies, while raising awareness about the achievements of women in engineering. The society holds bi-weekly talks featuring inspirational roles models from a cross-section of engineering disciplines, backgrounds and career stages.

In 2010, only 10.5% of engineering roles in the UK were held by women, rising to 16.5% in 2021 (EngineeringUK, 2022). Seeing the low representation of women in engineering, WES Durham champions inclusivity and applied for Durham University's EDI & Widening Participation fund to host our Empowering Engineers Symposium. Recognising the power of role models, WES Durham aimed to connect students with local North East engineers, to maximise impact locally. The event featured a panel discussion (made up of Krystina Rampeearee, Dr Henna Bains, Dr Raheleh Kafieh and Helen Cumming) on the role of intersectionality in tackling the world's engineering challenges and the importance of diverse workforces, followed by an interactive workshop on career development in the form of Career Speed Networking which fosters connections. The event was supported internally by Durham University staff and by 14 external speakers from WSP UK Ltd, BAE Systems, Sir Robert McAlpine, Waterman Aspen, EJW Solutions Ltd, Kinewell Energy, Northern Powergrid, Stanley Black and Decker, University of Sheffield, and GRAHAM.

The event was a huge success, and the activities had a positive impact on skill development. Participants recorded a 74% increase in confidence when asking questions, 68% in networking and 67% in speaking up in large groups, which met our event's primary aims. Our evaluation also highlighted that the qualities sought in role models are passion, integrity and compassion. In terms of role model characteristics, respondents are seeking to identify with a role model's gender, age and socioeconomic background, highlighting the importance of diverse role model visibility. Ultimately, WES Durham aims to empower engineers through skills development, confidence building and promoting diversity and inclusion, while helping to facilitate powerful connections and mentorships. We strive to create a future where diversity and inclusion flourishes in engineering.

EngineeringUK, 2022. Women in Engineering: Trends in women in the engineering workforce 2010 and 2021 Extended Analysis, London: EngineeringUK.

Automation Business puts 30th birthday celebration in motion

Motion Control Products were delighted to have hosted the Women's Engineering Society (WES) Hants and Dorset Cluster as they celebrate their 30th birthday. This family business has been at the forefront of advanced motion control and automation since 1994. The Motion Studio is there to enhance marketing and enable other companies to elevate their digital presence. So, it was no surprise that the WES Cluster members and guests found the site so interesting!

Following a health and safety briefing, Daniela Gregova gave an overview of the company and products, elaborating on how the site has been invested in over time. India Mckay then shared her own development with the company and why so many employees have enjoyed such long careers there. Attendees enjoyed a site tour and the enthusiasm and energy of the team was contagious. From the wide-ranging stores to prototype engineering, it was clear that any original equipment manufacturer (OEM) can benefit from collaboration with the team.

Luke Mckay, Operations Director, said: "It was a privilege for Motion Control Products to welcome the Women's Engineering Society cluster. As a business, we are committed to supporting and promoting diversity and inclusion across the industry."

www.wes.org.uk/regional-contacts-clusters
www.motioncontrolproducts.com

Obituary

It is with sadness that we announce that Dorothy Hatfield, WES President from 1989-1991 died on 16 April 2024, aged 84. Dorothy had a long and successful career in engineering and was an active member of WES.

If you knew Dorothy and have any memories you would like to share then please contact **Helen.Close@wes.org.uk** as we will be commemorating Dorothy's life in a future edition of The Woman Engineer.

PARTNER NEWS

WES is delighted to welcome our new partners:

Company: OPMobility, Star Refrigeration, Dales Marine, EQUANS, Moog, Bombardier

Education: University of Nottingham

We are also grateful for renewing partners, which include:

- Alexander Associates Technical Recruitment
- AstraZeneca
- Avove
- Bechtel Ltd
- Carbon Neutral Fuels
- Durham University
- EEMUA
- Electricity North West
- Equinix
- Evolito
- GCHQ
- Gratte Bros
- Horton and Horton Fire Ltd (H & H)
- Ingersoll Rand
- Kone Plc
- Laing O'Rourke
- Marubeni-Komatsu Ltd
- Mercedes AMG High Performance Powertrains
- Muddy Machines
- Queen Mary University of London
- Reliance Worldwide Corporation (RWC)
- Rotork
- Spirax-Sarco
- Thales
- Uniper Energy
- University of Edinburgh
- University of Leicester
- University of Sheffield

Thank you to our Annual Conference sponsors:

Headline sponsors: Mercedes AMG High Performance Powertrains, and CNH Industrial

Conference sponsors: Ingersoll Rand, Amazon, Leonardo

Exhibitors: Harwin, Sellafield, Frazer Nash, DP Squared de Simone, ISS Facilities, STEM Returners and Capula.

The next available event to collaborate with us on is International Women Engineering Day, being held 23 June, 2024.

For partnership and sponsorship enquiries, please contact: **partners@wes.org.uk**

NEW MEMBERS

The Women's Engineering Society (WES) are delighted to welcome our new members:

- Abby Semple
- Abi Holloway
- Adrian Grinov
- Ahana Roy Choudhury
- Ainara Duran Hervas
- Akua Opong
- Alexis-Rose Brighton
- Alice Monti
- Alice Siri
- Alina-Florentina Lighean
- Alyx Murdock
- Amandhi Karunatissa
- Amelia Ku-Neale
- Amy Richardson
- Amy Stevenson
- Anna Kupczak
- Anne-Lise Gras
- Anusree Sreedeep Nair
- Ariane Kamkeng
- Ashnaa Rahalkar
- Aurelia Brzezowska
- Aurore Knight
- Ayanat Turganbayeva
- Ayobami Lawal
- Begum Irdawati Dowlad Rahuman
- Ben Sheehan
- Beth Kimani
- Boohema Boohene
- Camila Rey da Rosa
- Cerys Burrows
- Charlene Wortley
- Charlotte Little
- Chloe Turner
- Claire Riley
- Claire Roberts
- Clare Mills
- Courtney Kennedy
- Curtysha Gaskin
- Daniela Buzea
- David Dixon
- Debbie Phillips
- Deborah Paine
- Deepthy Chullikkatt Kunjachan
- Dena Rahman
- Dorothea Tomeli
- Ekta Sharma
- Elandra Stafford-Williams
- Elizabeth Sutton-Thompson
- Emilia Terzic
- Emily Jack
- Emily Stagg
- Emma Abrahams
- Emma Houiellebecq
- Emma McCloy
- Emma-louise Smith
- Erica Barnes
- Esther Mgbemeje
- Filomena Paiva
- Gee-Sian Leung
- Grace Sambrook
- Gracie Dimond-Banks
- Hari Lakshmi Baddikere Thimma Shetty
- Hiske Buddingh
- Ian Mercer
- Ikra Mavi
- Iwona Gajda
- Jacqueline Dixon
- James Chestnutt
- Jane Power
- Janine Bull
- Jasmine Kinsman
- Jenna Abbott
- Jenny Baker
- Jessica Boland
- Jessica Jones
- Jihane Ismaili
- Jing Jiang
- Joanne Latham
- Jordan Stuart
- Julie Forbes
- Justyna Zwijacz-Kozica
- Kalita Patel
- Kate Stedman
- Katrina Williams
- Kay Cody
- Khadijah Khatun
- Kitty Clarkson
- Lauren Harrington
- lisa cooper
- Lucy Davison
- Mara Anca
- Maria Bruna
- Maria Jones
- Martine Nolan
- Maryam Abdulkareem
- Maryam Abdulsalam
- Maryam Malekshahian
- Mawada Abdellatif
- Megan Longyear
- Megan Williams
- Mi Tian
- Mimosa shorunkeh-Sawyerr
- Monalisa Musa
- Mouna Chetehouna
- Naomi Hutcheon
- Nasira Mohammed
- Natalie Gray
- Natalie Collcutt
- Natasha Bialecki
- Nicola Bailey
- Nicola Brown
- Nidhi Datta
- Nidhi Mudgal Datta
- Nikki Roberts
- Nikte Norma Ocampo-Guerrero
- Nishtha Shree Moharana
- Noor Mawas
- Nur Sarma
- Oana Porutiu
- Oksana Dmytryshena
- Ola Atoba
- Oladoyin Diamond Jegede
- Parichat Pholasak
- Paula Stevenson
- Petra Gratton
- Philippos Kyperountas
- Pia Smith
- Priyali Chougule
- Professor Ian Green MBE
- Purity Waweru
- Rachael Barlow
- Ragini Jain
- Rahele Kafieh
- Rahila Ehsan
- Renata Wojdyra
- Richard Jepp
- Richard McDonnell
- Rosemary Daniel
- Ruissein Mahon
- Rula Sharqi
- Saba Maqbool
- Sally Walters
- Samantha Bamford
- Seemal Asif
- Semina Ertogan
- Shiva Fallah
- Siqi Sun
- Sorrell Atlee
- Stavroula Macdonald
- Susan Francombe
- Tarisai Gundu
- Taya Williams
- Teodora Marian
- Tonya Freeman
- Vanessa McNiven
- Victoria Ashworth
- Vivian Cardenas
- Wendy Preston
- Yingjie You
- Zara Dando

WES APB summer updates

Networking event

Another successful networking event was held at Ricardo plc Shoreham Technical Centre and hosted by Laura Kershaw, Vice-Chair of the WES apprentice board.

The attendees enjoyed an informative and engaging day, hearing from keynote speakers, such as Joanna Rowe, about their career journeys. They were also given a behind the scenes tour of Ricardo's innovative technical centre, including the vehicle test facilities, the McLaren engine production line and a VR experience.

Claire Maycock from IMechE spoke to the guests about the benefits of professional registration. Rhiannon Chalmers-Brown provided some hydrogen safety training with a group workshop to make the attendees think about how to safely use hydrogen as a fuel in application. Finally, there was a panel discussion with Helen Burbidge, Natalia Adamson and Huw Roberts.

Thank you to everyone who attended! We look forward to the next one.

WES Annual Conference apprentice board meet

The WES apprentice board attended the WES Annual Conference with the days enriched with inspiring talks from remarkable women from across the engineering industry.

Alongside the event the board had a great in-person meeting to reflect on what they had achieved over the past year and then strategised plans for the year ahead.

Recruiting new apprentice board members

Completing an engineering apprenticeship? Want to help more women into the industry? Join a team of passionate apprentices to help advocate for women in engineering.

Apply now to join the Women's Engineering Society Apprentice Board!

The WES APB is a national board consisting of 12 engineering apprentices. Board members are located across the county, spanning different engineering sectors. Part of your role will be creating content for our socials, planning events and connecting female engineering apprentices across the industries.

Sound like something you would be interested in? Apply now through the link on our social media pages on Instagram @wesapb and LinkedIn WES Apprentice Board. Application window will be open until end of May.

Conference theme for 2024: Enhanced by Engineering

Women engineers, sponsors and allies from across the UK descended on the Eastside Rooms in Birmingham on 17 April, 2024 for the WES Annual Conference, one of the largest networking events specifically aimed at women engineers in the UK. The theme for 2024 was *Enhanced by Engineering* and we enjoyed two full days of talks and networking opportunities designed to inspire and engage women engineers across all disciplines.

The conference, which was opened by our President Dr Katherine Critchley, kicked off with a bang thanks to Dr Shini Somara. He is an inspiration for women in STEM fields. We then heard from Louise Hardy, Non-Executive Director at Balfour Beatty Plc, Crest Nicholson Plc, Travis Perkins Plc and Severfield Plcs on *Women in the Built Environment*. Louise is a civil engineer with a remarkable career including being responsible for managing a £2bn portfolio of projects on the London 2012 Olympic Park. There was a fascinating talk by Kerry Evans, Senior Operations Manager for UK Highways A55 Ltd, who shared her experience of leading the closure of the Menai Suspension Bridge. This was followed by a lively discussion on how to address the 'leaky pipeline' in the engineering workforce, which was led by the Engineering and Physical Sciences Research Council.

Career development

During the first afternoon, conference offered some insights into career development as Rosa Wells, FE Principal and Dean for STEM, UCB, and Board Director for GBSIoT, showcased the benefits of professional registration. In addition, Elizabeth Donnelly, WES CEO, gave a workshop on building confidence. After a fascinating panel session on *Enhanced Engineering* and the impact woman make, the day closed with an exclusive preview of the results of the WES PPE survey. Find out more by turning to page 22 of this issue.

Second day

Day two was opened by WES Trustee and ally, Vince Pizzoni, before we heard from Claire Gott MBE, the Head of Industry and Deputy of Structures UK, on how engineering transforms lives. We were delighted to be joined by representatives from STEM Returners, who gave a great insight into how to develop a successful returners programme. Equal Engineers founder, Mark McBride, discussed how to promote equality and diversity through leadership, and IET Young Engineer of the Year award winner, Titilola Oliyide, Senior Process Safety Engineer at Supercritical Solution, who is working on a key pillar of energy transition with green hydrogen.

Celebrating 100 years

This year we are celebrating 100 years of the Electrical Association of Women, and WES Heritage Manager, Helen

Close, gave a fascinating overview of the organisation and its background. The afternoon was started by another WES trustee, Susan Robson, as she welcomed Emma McCaig from our headline sponsor, Mercedes AMG High Performance Powertrains, who gave a great presentation on how diversity is key to winning every race.

Our sponsors continued to be showcased during a panel session on how digital engineering can be used to enhance working lives. The final talk of the day was about MentorSET and included the MentorSET sponsor, Ricardo.

Of course, alongside all of the great talks and panels, one of the important elements of the conference are the networking opportunities. The event creates a superb chance to make new contacts within the industry, while building new networks. The exhibition hall was buzzing, and our sponsors enjoyed meeting and chatting to delegates throughout the day.

The organising team were overwhelmed by the positive feedback and we can't wait to do it all again for you in April 2025.

RNLI SUPPORTS WOMEN IN ENGINEERING

Heather Nice is a computer aided design (CAD), product data management (PDM) and configuration manager with the RNLI. In this article, she explains how it hasn't been all plain sailing for her to reach this position; she has had one or two surprising reactions to her seniority, but this served to give her the motivation to be a role model for other women, inspiring them to reach their true potential.

I have always admired the work that the RNLI does. I read all their magazines when I was growing up, collected all the badges and enjoyed learning about the different classes of lifeboats. When I was looking for a new role, I saw a job opening at RNLI and was so excited to apply. It was in the engineering department, and it suited my skills in configuration management perfectly. I secured the position to manage the team and I have never looked back.

Although I work in the engineering department and manage engineers, I am not an engineer myself. The configuration part of my team has contributed to many, if not all, of the different design projects and innovations, ensuring that the designs and data are robustly captured, so that we understand the intricate differences between our lifesaving assets. My PDM team keep the software systems and processes up-to-date and work to make sure that the engineering designs can be approved and rolled out. My CAD team create the 2D and 3D models and drawings of our assets that are then used to build and manufacture, purchase parts against, or used to maintain and assure our assets throughout their life.

Heather Nice, CAD, PDM and configuration manager, RNLI

"As more women enter engineering roles within the RNLI, the organisation stands to benefit from a wider range of perspectives and experiences."

I believe that diversity helps organisations to become successful, as everyone brings a unique perspective and set of ideas. As more women enter engineering roles within the RNLI, the organisation stands to benefit from a wider range of perspectives and experiences. This diversity can foster innovation and lead to more effective solutions in areas such as boat design, equipment development and rescue techniques.

Female strengths

Stereotypically, women tend to bring traits such as supportiveness, warmth and cooperativeness, as well as being kind and helpful. Some would argue they are better at multitasking and very intuitive. Engineers, irrespective of gender, generally tend to be logical thinkers, creative and are naturally curious. Of course, we're all different and I firmly believe that you need a mix of people to create balance and success.

I have faced my own adversity within my career in engineering. A particular instance was during interviews, where I was interviewing with a male colleague. I introduced myself to the candidate as the manager and the candidate actually laughed…safe to say he didn't get the job. I try not to dwell on the negative experiences, but, instead, use them to challenge difficult behaviours and change perceptions. A challenge I think most women in engineering face is the lack of role models. You have to see it to be it. Having relatable role models gives the confidence to women that we too can achieve great things. Within engineering, the senior leader role models tend to be male. This has given me the motivation to be a role model for others, and inspire them to grow, develop and reach their true potential.

Mentors

Mentors and support networks are incredibly important for helping our people succeed. Creating an inclusive workplace culture where people, including women, feel supported and valued in engineering roles is essential. It's important to have people we can turn to, to ask questions, to guide us, who we can learn from, and who believe in us. It enables us to build a network which offers growth and equips women to confidently navigate through the engineering industry. When we feel connected to an individual or a network, it usually results in easier communication and the confidence to speak up and share experiences. Mentors provide us with practical experience and application of principles and theories, role model good behaviours and hopefully aid us in our eventual career advancement.

Heather with colleagues at RNLI

Go for it!

My advice to other young women would be to '**go for it!**'. You don't have to be an engineer to work in engineering, there are plenty of roles related to data management, processes, quality, project management, reporting and many more so you are very likely to find a role that suits you. All engineering roles and companies have their own benefits and rewards; however, nothing compares to working for an organisation that is bigger than yourself. The RNLI saves lives at sea and it is rare to find another engineering organisation that enables us to do that. A common theme among employees at the RNLI is that everyone wants to contribute to saving lives, whether that's designing and building new assets or keeping our current fleet on service. No other organisation can give you the same feeling of job satisfaction.

Encouraging promotion and ambition

The RNLI will continue to help women evolve in engineering by continuing to be flexible (regarding family related hours etc.), as well as ensuring there are clear and visible women in management, engineering roles and mentoring positions. This will encourage promotion and ambition in those coming into the charity, as well as highlighting opportunities for further learning, helping them to stay motivated and enabling women to embrace learning and not feel embarrassed by success.

A diverse workforce

Challenges that most organisations will face will be regarding retention of their employees. It's important to attract a diverse workforce, which includes female engineers, but it is just as important to retain the knowledge and experience they offer. By prioritising diversity and inclusion, the organisation can build a stronger, more innovative workforce better equipped to fulfil the RNLI's mission of saving lives at sea.

https://rnli.org/

THE ELEPHANT IN THE ROOM: MOTHERHOOD IN ENGINEERING

BY VERENA HEFTI MBE, CEO AND FOUNDER OF LEADERS PLUS

Everyone is talking about inclusion at an early career stage and it is certainly encouraging to see that 19% of engineering and technology degree applicants in 2023 are now women, up from 17% in 2022[1].

Young female engineers are told their future is bright in grand speeches by senior leaders about equality. But the motherhood penalty hits hard when women have children. Too many women feel forced to choose between progressing the engineering career they worked so hard for and their family **and women engineers are leaving the profession in droves because they can't see how they can combine a family with engineering.**

The average childbearing age in the UK is 31,and 57% of female engineers drop off the register of professional engineers by the age of 35, compared to just 17% of their male counterparts[2].

As one parent that our social enterprise supported said to me: "Everything is generally considered fairly equal up until this point [before children arrive] and then it's almost a silent fact that a woman's engineering career progression freezes when she has a baby."

If mothers don't progress to senior roles, closing the gender pay gap (which is above 25% in some engineering firms) will be impossible. Employers who don't care about that progression should consider that losing women after they have children exacerbates the huge engineering skills shortage and is expensive with recruitment fees costing 15-30% of an engineer's salary.

These issues don't just affect mothers, they also affect any woman who looks as if she is at an age where she might plan a family, or even someone who is experiencing a miscarriage. It makes women wary of mentioning her family plans and some consider leaving their job even before starting to try to get pregnant.

The stress of the second shift

Engineers who are the primary caregivers in their family deal with the second shift: household chores, raising children and the mental load of family admin. This stress is exacerbated by the financial stress caused by childcare costs, work overload and lack of consequences for discriminatory behaviour towards women. Employers should identify causes of additional stress for working mothers and implement policies such as structured reinduction programmes after maternity leave or competitive parental leave and support policies.

Flexibility matters

Many employers think flexible working is sorted post-pandemic, but it isn't. Working mothers get frustrated seeing those without caring responsibilities progress to senior roles requiring full-time work. It's not just formal flexibility that matters; informal flexibility, such as being able to attend school events or being able to deal with family emergencies is crucial.

Line managers matter

When you announce a pregnancy or adoption, does your manager say "congratulations, how wonderful" or "oh – ok, that is really inconvenient timing for our big project". Both are real life responses from managers. Employers need to provide support and training to line managers – simple checklists for what to do can be helpful but having honest conversations to identify and tackle assumptions is also critical. Every manager must consider a woman returning from maternity leave for promotion, just like everyone else if we are to tackle the motherhood penalty.

Let's talk about the C word: 'commitment'

One civil engineer recently told me: "When I rush off at 5pm to pick up my children from nursery, I can feel the accusing glances." Research found that unfounded assumptions of how being a mother affects productivity makes a significant contribution to women being pushed out of STEM roles[3].

In our own Leaders Plus research (**https://www.leadersplus.org/careerprogressiongaps/**) we found that 42% of working mothers had received comments questioning their commitment to work.

But working parents don't leave because they are lazy, they leave because the work environment isn't designed for them.

Employers need to become expert at good job design

Engineering, more than most other professions, relies on long travel to client sites as well as overtime and weekend work to get projects done. Leaders Plus research found that 85% of working parents are prevented from applying for senior roles because they believe the workload would be incompatible with their caring responsibilities such as picking children up from childcare on time. 86% of working parents reported they want to progress their careers, but only 30% felt they could do so with their current employer. That's not because they are not committed to their engineering career, it is simply because they enter the second shift and are busy with their family job.

Use the same approach you would use for an engineering problem: define what needs to be achieved, then scope out options for achieving this e.g. in a job share, a full time role or several part time roles, then set parameters for success e.g. project delivered and then identify, experiment and measure if it has been successful.

Vocal support from the CEO changes what is possible

In Leaders Plus research, the 25% of parents who said they did not feel held back by having children were more likely to feel that the CEO and leadership team were supportive of working parents. If you are a senior leader reading this, shout about your support for working parents and let the actions, policies and the budget follow, for example by putting budgets aside for a phased return to work after maternity leave, paid time off when children are sick, a well-funded employee parent network, or training for line managers.

Realistic role models matter

The lack of working mothers in senior roles in engineering puts women off from even trying to combine a senior engineering career with bringing up children. In the Leaders Plus research, 66% of working parents said that realistic role models are critically important to their motivation for progressing their career with their current employer.

There is one simple way to create role models of working mothers in senior roles, and that is to provide targeted support to working parents already in the workforce such as the Leaders Plus Fellowship programme, which has a track record of getting working mothers in to more senior roles in engineering.

What we can do as working parents in a system that isn't set up for us

Don't despair. There are other working mothers out there who want to progress their careers but not at the expense of their families.

Try to connect with them at your workplace or in communities such as Leaders Plus.

Secondly, put your employer in touch with an organisation that is expert in career progression of working parents. Too often, we expect working mothers to not just carry the burden but also fix the system, there are organisations that support employers to drive change so that you don't have to.

Thirdly, help change the conversation by telling your story; when you meet a senior leader, tell them your story of combining a demanding career with young children and your ideas for change. And never ever apologise for having children.

1. *Opportunities for women in engineering | Prospects.ac.uk*
2. *Royal Academy of Engineering*
3. *Women face motherhood penalty in STEM careers long before they actually become mothers (theconversation.com)*

THE ENGINEER'S JOURNEY:

Kim Groshek's quest for balance and innovation

In the fast-paced world of engineering, where algorithms evolve so quickly, **Kim Grochek** stands out for her unique approach to success: As *The Pause Lady*, Kim's story is not just one of technical skill but also of personal growth and the search for balance in a field ruled by new ideas.

Growing up, Kim was drawn to the world of problem-solving and numbers. Her early exposure to her father's work as a computer operator sparked her fascination with technology. She vividly remembers the allure of IBM punch cards and the thrill of dismantling and reconstructing her first computer – a passion that would shape her future.

Kim always knew she was destined for a career in engineering. After earning her master's degree in computer science, Kim swiftly ascended the ranks of Fortune 100 companies like Kraft, GE and New York University. Her expertise in Enterprise Confluent Platforms, Kafka API, Streams & KSQL, and Enterprise Splunk API positioned her as an executive consultant, contributing to the evolution of technologies from modems to cloud storage, personal computers to smartphones, and beyond.

Kim's experience is a testament to all young women

While running her own consulting company, Kim became a sought-after transformation consultant and programme manager, specialising in revitalising struggling companies on the verge of bankruptcy, managing mergers and acquisitions and orchestrating major global systems and behavioural upgrades. With a keen eye for detail and a strategic mindset, Kim meticulously diagnosed underlying issues within organisations, designing strategies to overhaul structures, processes and cultures and navigates complex global systems, orchestrating seamless transitions and driving behavioural changes among employees. Kim's interventions can catalyse profound transformations, reshaping companies into resilient, forward-thinking entities poised for sustained success.

Business transformation

Kim has always been drawn to the relationship between technology and business. With two master's degrees and decades of experience, she stood at the intersection of innovation and strategy, ready to mastermind change wherever she went.

From her early days teaching at DePaul and UW-Whitewater Universities, Kim developed a knack for distilling complex concepts into digestible lessons. Her classrooms were not just places of learning but incubators of inspiration, where students were encouraged to think critically and embrace the evolving landscape of technology and commerce.

"My athletic endeavors serve as more than just physical challenges – they're also fertile ground for creative inspiration and this trickled into my work life as well."

But Kim wasn't content with just imparting knowledge within academia, she moved into the realm of business transformation and as a senior project manager and business consultant, guiding organisations worldwide through turbulent periods of change.

One of her standout projects was at Associated Bank, where she spearheaded a $27 million deployment to fortify their security measures and streamline operations. She navigated the complexities of federal compliance standards to ensure that more than 7,000 individuals and 55 systems were efficiently integrated into the new framework.

Kim transitioned from financial institutions to multinational corporations such as QBE, where she orchestrated a $19 million implementation of cutting-edge security initiatives across 36 countries and used agile methodologies to drive teams towards collective goals with unwavering focus.

Wisdom, tenacity and resolve

But perhaps Kim's true skills lie in her ability to bridge the gap between theory and practice. In her role at large-scale banks, she transformed entire systems; overseeing the implementation of complex business servicing solutions to bring a new era of efficiency and excellence.

Amidst the corporate endeavors though, Kim's passion for teaching burned as bright as ever, and she continued to inspire the next generation of leaders through masterclasses and speaking engagements and universities, where her insights left an indelible mark on all who learned from her. She pursued her PhD in organisational leadership and certifications in project management and cybersecurity and in every endeavor, she shaped the world around her with wisdom, tenacity and resolve.

Mental and physical wellbeing

Now sharing her insights on mental and physical wellbeing live and on social media since 2023, Kim has been a role model for personal growth since 1990. She has built multi-billion dollar empires using solutions she learned and, recognising the potential pitfalls of technological influences, she has taken a pause, to teach elite leaders to embrace more straightforward values of intentional living, self-love, and genuine human connections.

Amidst the chaos of deadlines and code, Kim yearned for a moment of pause. This desire for balance came to her following an encounter in Chicago when a young boy collided with her while engrossed in his Gameboy. It inspired Kim to challenge the pervasive influence of technology and advocate for 'intentional living' and the pursuit of a more meaningful life.

Creative inspiration

During her hours of training for marathons, Ironman races and triathlons, she has often used the solitude to brainstorm creative ideas for her artworks and novels. She said: "Some of my best story plots, character developments and artistic concepts have emerged during these physically demanding sessions.

"My athletic endeavors serve as more than just physical challenges – they're also fertile ground for creative inspiration and this trickled into my work life as well."

Practice the Pause

Kim is pioneering a movement of peace and healing within families, particularly focusing on children, through her Practice of Pause® initiative and Pause Power® awareness campaigns. By encouraging individuals, families, organisations and companies, especially those in higher education, to participate in the Pause® Challenge, Kim aims to create safe and supportive environments for healing and personal growth. With a vision of ongoing encouragement and community support, Kim emphasises the importance of self-awareness and emotional resilience in overcoming past traumas and improving quality of life. Through the Pause® events and programmes, participants gain mindfulness skills and mental health techniques, leading to reduced stress, improved productivity and enhanced emotional wellbeing. With the tools provided, individuals can effectively manage anger and stress, benefitting both employees and organisations. Additionally, donations made through the programme support mental wellness initiatives, ensuriing that each person can thrive and contribute to a harmonious, supportive community for years to come.

https://kimgroshek.com

"Become an engineer and improve the world we live in"

Melissa Ahmed is a chartered engineer and a young entrepreneur. Showing that engineering can be a viable career choice for all, she is a role model for engineers, women from ethnic minorities and other young entrepreneurs.


Melissa Ahmed CEng

By the age of 27, Melissa had achieved Chartered Engineer status (IMechE), was a certified SOLIDWORKS professional member, part of the SOLIDWORKS Champions Program[1], a STEM and female role model, an advocate for women in engineering and, on top of all that, a successful entrepreneur, running Techwuman Ltd, a design engineering consultancy.

Like many women, engineering wasn't her first choice of career; nor was it a career that was promoted to her throughout her education. Since childhood, she'd had a great interest in science, maths and arts subjects and spent hours exploring and investigating, trying to understand how things worked. When it was time for her to choose her degree subject and specialise in an industry, she struggled to identify her 'perfect job'.

Trying to decide on a career is a difficult decision for a 17-year-old. Melissa said: "I had so many questions when I was deciding on what to do after my A Levels – university, an apprenticeship or a full-time position, where would I live, what industry would I choose, would I study an integrated master's …the questions were endless. And the answers were placements – and lots of them!

Family support

Melissa had very supportive parents who organised placements in different STEM industries so that she could have a peep into a variety of roles within different industries. She went to a pathology lab, shadowed ward rounds and observed operations at a hospital in Sri Lanka, completed a graphic design placement and, finally, a civil engineering placement at a cement factory in Sri Lanka. She also benefitted from hearing and learning from the first-hand experience her father had in his aviation career as well as her grandfather's experience of being a mechanical engineer.

This diverse work experience enabled her to work out what she liked, but more importantly, what she didn't like. Melissa decided on aeronautical engineering as her degree as she wanted to work on emerging technology, and it fitted in very neatly with her passion for travel.

Degree subject

Throughout her degree, Melissa knew that she had chosen the right subject as the content was stimulating and she enjoyed all the topics taught each term, but she said she was always concerned about the lack of women on her (and other) engineering course(s) and she couldn't understand why women were so underrepresented.

She said: "Looking back, as a woman I was always in the minority; one of two in my physics and maths A Level classes, and I realised that this was due to the misconceptions around engineering and engineering roles, and that the only way to improve this was to show other women a real insight into studying engineering.

"I did this by being a mentor for placements held at Salford University for women A Level students and I loved explaining what I did to try and inspire them to study engineering and other STEM-based subjects at university."

> "I HAVE MADE IT MY MISSION TO BE A WOMAN LEADER IN ENGINEERING, TO BE THE ENGINEERING ROLE MODEL I NEVER HAD AT THE START OF MY CAREER."

Underrepresentation of women

Melissa saw that this underrepresentation continued throughout her degree and when she participated in an industrial placement year, she was the first woman to be employed in the company's technical department. But she said: "My placement year was invaluable as it was here that I found my true passion; design engineering.

"This role changed my insight into the industry and allowed me to leverage and develop my strengths. It also helped me realise that working with a team of men wasn't as daunting as it had been made out to be."

Progression

After her placement year, Melissa completed her degree, achieving a first. Her ambition was to study for an MSc straight after her degree and she found a role that would allow her to work, study and develop at the same time – a Knowledge Transfer Partnership (**https://www.ktp-uk.org/**)

The Knowledge Transfer Partnership (KTP) allowed her to work on a project to improve the security industry by revolutionising the design procedure for physical security products with the implementation of 3D simulation. This procedure improved the efficiency of the design process for products tested and certified to the LPCB LPS 1175 security standard. The KTP also allowed Melissa to complete an

MSc in mechanical and aeronautical engineering as well as hugely beneficial CPD. She became an incorporated engineer, completed a Level 5 award in management, achieved yellow and green belt level in Lean Six Sigma (a team-focused managerial approach that seeks to improve performance by eliminating resource waste and defects) and completed a SOLIDWORKS simulation course.

Still though, her journey within the engineering field up to this point led her to question where are all the women? This made her determined to try and make a change in the industry.

She said: "Like-minded women who are in engineering need to devote time to showcase their jobs and stories to empower more women to consider taking up a career in engineering, because if you can't see role models who look like you, you're less likely to follow that career path.

"The beauty of engineering lies in its diversity, the fact that as an industry, its specialisms are so varied. The skills you learn are transferrable, so you aren't stuck in one particular role – no one told me that and I had to learn this myself.

"I have made it my mission to be a woman leader in engineering, to be the engineering role model I never had at the start of my career. Seeing my determination to be a woman role model was the key driver behind my father setting up Techwuman; he wanted to support and provide me with a means of promoting women in engineering while developing my career."

STEM

Research shows that young people's awareness of STEM increases by 90% following STEM events and within four years of starting the Techwuman STEM Activity Day programme, the company has delivered STEM sessions to more than 3,700 pupils across the UK. Techwuman's vision is to demonstrate to the younger generation that there are numerous opportunities available to them which they may not have been aware of, or even considered before.

Melissa explained: "We host STEM activity days in primary and secondary schools; with a focus on primary schools as it gives pupils time to think about what they'd like to pursue as a career before they must pick their GCSE subjects.

"We engage with our STEM ambassadors who have diverse backgrounds with their own story to tell. We currently have more than 60 STEM ambassadors, all at different stages in their careers, and more than 70% are women. When school pupils see the number of women in STEM careers first-hand, it helps to challenge established stereotypes and perceptions they may have.

"It is incredibly rewarding when someone comes up to me at the end of an activity day and says they want to be an engineer like me – it's wonderful knowing that you have inspired someone."

Not all plain sailing

According to EngineeringUK's 2022 Women in engineering report[2], women comprise 16.5% of the engineering workforce – this is up from 10.5% in 2010 and a great achievement. UCAS 2023 admissions data revealed that nearly a fifth (19%) of applicants for engineering and technology degree programmes were female, up from 17% in 2022. With the UK engineering sector experiencing a shortage of skilled professionals and only 8% of UK engineers from BAME backgrounds, more role models are required to increase this number.

Melissa finished by saying: "I hope that this article will help to inspire and encourage others in the engineering sector to do all that they can to try and make a positive impact on the industry, and encourage women to get involved in societies such as WES and other campaigns where they can share the story of their journey into engineering. Let's break the perceptions and stereotypes surrounding engineering!"

Techwuman is an engineering consultancy company specialising in design engineering for the physical security of critical national infrastructure. Its mission is to empower women in engineering, improve gender parity in the industry and promote STEM careers to the next generation.
https://www.techwuman.co.uk/

Key achievements

2019 – Melissa was featured in the WES Lottie Tour and school poster
2019 – Melissa was involved in the first ever diversity campaign by Institute of Engineering & Technology (IET)
2020 – Melissa was a finalist for Engineering Ambassador of the Year in the British Engineering Excellence Awards
2020 – Melissa was one of 19 women engineers featured in the Portraits of Women Engineers exhibition
2021 – Techwuman was awarded SME of the Year by Engineering Talent Awards
2021 – Melissa was awarded Rising Star at University of Salford University
2022 – Techwuman was a finalist for CSR Champion Award in the British Security Awards
2022 – Melissa was a finalist in the Together Award in the BBC Radio Manchester, Make a Difference Awards
2022 – Melissa was one of 95 engineers featured in the IET Celebrating Impact exhibition
2023 – Techwuman won the IP&E Engineering Education Award
2023 – Techwuman was a finalist for the IP&E Engineer of the Year Award
2023 – Techwuman was a finalist for the IP&E Industrial SME of the Year Award

1. The SOLIDWORKS Champions Program aims to acknowledge and connect community members from around the world who go above and beyond in sharing passion and expertise
*2. **https://www.engineeringuk.com/research-policy/diversity-in-engineering/women-in-engineering/)***

Getting your first graduate job as an engineer in six months

Having worked in 64 countries, 12 sectors and in multiple roles over a 48-year career in business, **Vince Pizzoni** has cast his eye over more than 40,000 CVs, conducted 10,000 interviews and recruited several hundred personnel. Now a career coach, business mentor and professor in chemical and environmental engineering, if anyone should know the dos and don'ts of graduate job hunting it is him!

The application process for graduates can look scary particularly with the use of new technology such as video interviews and artificial intelligence, but with the right preparation, focus and determination you will get that job!

Apply early

Start early to get work experience and internships. Graduate roles are advertised from July/August of the final year with corporates traditionally towards the year end and smaller, mid-sized companies from January to July. So if you want to start a graduate role after completing your final year, apply very early.

Get 'match fit'

Just like sports you need to be 'match fit' Get your CV up to date and ensure you have a professional LinkedIn profile. Your CV should be tailored to the company and role and must highlight your academic knowledge, work experience and interests. Employers want to see specific and measurable achievements. Always ask yourself the question "so what?" when you refine the achievements as it's a great way of getting to the end point. Use action verbs and highlight key skills developed. Employers are looking for graduates that show breadth so get involved in volunteering, sports, music, arts and societies etc. The LinkedIn profile needs to be complete with a professional photo, work experience and academic qualifications, and make sure you follow companies and their leaders of interest.

Application and the covering letter

I advise you target a few, key sectors and not use a scattergun approach of applying to everything. Gradcracker, Indeed, LinkedIn etc and your university careers website are preferred jobsites and Student Circus is a useful website for international students. Some companies will ask you to click a link to apply while others will ask for a covering letter, either way, it is important you conduct extensive research on the company beyond the immediate website and I advise you to submit a covering letter even if they don't ask for one (or say that it is optional). It may be the only way you can make an impression with the hiring manager, but it's unlikely that they will bother reading the CV if they aren't impressed by your covering letter.

The covering letter must be captivating and individually tailored to the company and role. Read the job description and highlight the skills and experience they seek then address these in your letter with specific examples.

Keep to a one-page letter format with a third of the page on why you are excited by the company, and the remainder on how your academic knowledge and key transferable skills are a good fit for the role. Put yourself in the hiring manager's shoes – you need to make them feel that their company is the only one you have ever wanted to work for! Talk to friends and alumni for tips on roles and the application process and use an Excel spreadsheet to track your applications. You may have to do online/psychometric tests which can include maths questions, verbal reasoning, gaming exercises and personality profiling and the key to success here is plenty of practice beforehand.

Treat every type of interview with positive body language, good eye contact and clear voice tone

The interview process

You've now made it through to interview, but before attending it, re-familiarise yourself with the job advertisement, go back over your application, and research the LinkedIn profiles of the interviewers. Also, talk to alumni and get their feedback.

The most common interview methods will be via video, phone, online and in-person. The video interview entails a series of questions with limited time to answer. Treat every type of interview with positive body language, good eye contact and clear voice tone. Interview questions fall predominantly into three areas namely:

- competency,
- motivational; and
- technical.

Acknowledgement
I would like to thank the editorial boards and staff of WES and the IChemE for their expertise and support in producing this article.

For competency questions use 'STARR' i.e. Situation, Task, Action, Result, Reflection. Typical questions include: 'Tell me a time when…' and 'Have you an example of…' so reflection is important and should consider lessons learnt and improvements you plan for the future.

Motivational questions could include: 'Tell me about yourself', 'What gets you out of bed every day?' and 'Why should we offer you the job?'. This allows the employer to understand your motivation for the company and the role you are applying for. Focus on the two or three things in each question that make you an ideal candidate using examples from your personality as well as from academia, work and other interests. Link your answers to their core values too. Interview practice is very important and for technical questions, show your workings and 'think out loud', try not to go quiet, don't pretend you know it if you don't, and always offer possible ideas and solutions based on what you do know.

Think of questions to ask the interviewers – possible ones could cover mentoring for chartered engineers, volunteering, new technologies developed and specifics about the job.

After the interview and within 24 hours, email back thanking them and expressing your interest in the role and company.

The assessment centre (AC)

An assessment centre (or assessment day) is a combination of tasks and activities that test your suitability for the job, so success at interview often leads to the assessment centre. Feedback from previous graduates indicates that you may now have up to a 20–30% chance of an offer. Preparation is key; research the company thoroughly, talk to alumni, gather tips on previous ACs, check out your interviewers and prepare an AC strategy.

The agenda may include interviews, assessment tests, in-tray exercises, team activities, presentations, business case studies, a tour of the facilities and social events.

Handle the interviews using STARR for competency, preparing for motivational, referring to core values and 'thinking out loud' for technical.

The assessments could also include psychometric and personality tests and may be compared to tests you completed prior to interview.

The in-tray exercise is managing multiple requests and identifying those which are urgent and most important. The key here is to make sure you manage your time to limit the 'urgent' and complete the 'important' in a timely manner.

The team activity could be a game such as 'marshmallows and spaghetti tower building' or a business-related activity. As the employer is looking for effective teamwork and leadership potential, be visible and take on a critical role such as time management or chair. Don't go silent. Work with the other candidates; support the quiet ones and take the comments from the louder ones, making sure the rest of the team have their say.

If it's a PowerPoint presentation, mix pictures with words and don't read the slides verbatim while presenting. Positive body language, good eye contact and clear and confident voice tone can often outweigh the content.

Show your interest and passion in the company and role. Ask questions and network at meals and drinks. After the assessment day write back within 24 hours thanking everyone and confirming your interest in the company and role.

They will choose the candidate they are prepared to spend a long-haul flight sitting next to! If you receive a rejection, make sure you ask for feedback for lessons learnt. Don't rush to offer your acceptance of a job offer. Review key areas including career prospects and cultural fit before making your decision.

Top tips

1. Prepare early and do your research.
2. Craft a compelling CV and stand-out cover letter.
3. Track your applications.
4. Network with friends, alumni and company contacts for advice and feedback.
5. Practice online tests and interviews.
6. Use STARR for competency questions.
7. Show alignment to company core values.
8. Display leadership and teamwork at the assessment centre stage.
9. Assume everyone you meet has influence on whether you get the job.
10. Send a thank you email after interviews and assessments.
11. Take your time with accepting multiple offers.

Vince Pizzoni, Professor in Chemical and Environmental Engineering at the University of Nottingham

About the author

Professor in Chemical and Environmental Engineering at the University of Nottingham, Vince has coached and mentored thousands; spanning the whole career lifecycle from school to university, executive to board level, and made it his mission to inspire and mentor future generations into STEM, engineering and energy careers.

Vince has 40+ years of relevant, global business experience incorporating executive management and board positions in blue chip companies including ExxonMobil, Suez, V. Ships, Nalco and P&G and today manages a portfolio career as a consultant in a boutique energy executive search firm, energy sector career coach to students at several prestigious UK business and holds Trustee/NED/Ambassador positions on several boards.

These include the Women's Engineering Society, Female Leaders in STEM Subjects, POWERful Women, MyBigCareer, FOCUS expatriates and the South Shropshire Multi-Academy Trust.

Vince is a Chartered Engineer and Fellow of several organisations including the Women's Engineering Society, Institute of Chemical Engineers, Energy Institute, and the Chartered Management Institute. He is also a Group Partner of Circklo.

LETTER FROM NEW ZEALAND

BY JO PARKER, BOARD MEMBER OF THE ENGINEERING COUNCIL

Last year I was lucky enough to be offered a three-month assignment in New Zealand, working for environmental consultancy, WRc, who were partnering with Project Max, a small specialist consultancy.

I left my home, and herd of alpacas, mid-September for a one-bedroom flat in Auckland, replacing an approaching winter for the onset of spring. There were other compensations – a golden beach just a five minute walk away from my flat and a superb office with state-of-the-art facilities just 30 minutes' walk away. Thankfully, my husband Neil was able to persuade his employers that 'working from home' didn't specify where in the world that home should be located. The New Zealanders are very open and friendly people and Neil and I received several invitations to visit people whilst we were there.

> WHILST IT IS SOME DISTANCE FROM THE UK, LIFE IN NEW ZEALAND SEEMS FAMILIAR, AND YOU COULD JOIN THE LARGE NUMBER OF ENGINEERS WHO ALSO RISE TO THE CHALLENGE OF WORKING IN A NEW COUNTRY.

However, it was tough at times. We found a superb house sitter back in the UK (who was also a good friend) but, dealing with the serious illness of one of our alpacas, a dearly loved pet, who eventually had to be put to sleep when I could not be there to say goodbye, was very hard. Also, I still wanted to keep my UK-based projects going so often had to hold meetings starting at 10pm but at least we are so used to online meetings and this was perfectly feasible; I don't think anyone was even aware of my location during the meetings.

Population

New Zealand has a population of slightly over five million, of which 1.4 million is based in Auckland. In comparison, the UK is now close to a population of 67 million. The land mass in New Zealand is slightly larger so towns are very spread out with swathes of glorious countryside. Those who have seen Lord of the Rings may fondly remember the stunning scenery. Having now visited most of the major towns and cities, I have been able to really appreciate it's beauty.

Water New Zealand conference

In October, I attended the Water New Zealand annual conference. Water New Zealand acts as a trade organisation for the numerous water utilities within the country, as well as a membership organisation for individuals. The conference was impressive, with more than 1,000 delegates, a substantial exhibition, and several thought-provoking keynote presentations including; one from Erin Brockovich, direct from the USA.

Maori attitude has positive effect

Another presentation was from a prominent Maori leader, who explained the difference in the attitude which Maoris have to the water environment.

There are huge opportunities for engineers in New Zealand

They consider managing the environment as a long-term committment, looking after it for future generations – maybe something we can learn from?

In New Zealand the impact of Maori culture on water management is very noticeable and is even enshrined in legislation. The concept of *Te Mana o te Wai* is that water is a valuable resource and is defined in the National Policy Statement for Freshwater Management 2020. The Water Services Act 2021 requires that drinking water suppliers and network operators in carrying out their duties under the Act must give effect to *Te Mana o te Wai*. This helps to promote a longer-term view of all aspects of the water cycle than we commonly see in the UK.

Impact of change of government

The Water Services Act 2021 was one of the positive sides of a very fractured industry where 64 service providers, most of them local councils, provide water and sewerage services. This is in contrast to just 18 water organisations in the UK. The previous New Zealand government was due to restructure the industry into 10 'entities' as part of the Water Services Reform Plan (also known as 'Three Waters, i.e. clean water wastewater and storm water) However, the change of government following the election on 14 October 2023 mean these proposals have an unclear future.

How the UK manage water leakage

The fragmented industry in New Zealand can make managing water services difficult. I presented a webinar during my stay, explaining what the UK is doing to manage leakage, as Water New Zealand had just issued an update to their NRW technical guide. One questioner wondered how they could keep up with the knowledge required for leakage along with all the other specialist areas needed as the one water manager for a small town? This is a real problem, with concerns about a lack of expertise and personnel. How can managers be experts at running water and wastewater networks plus water and wastewater treatment plants, on top of also managing storm water?

Some even manage activities outside of the water sector alongside their water responsibilities. I have no way of verifying this,;but I heard that one water manager also had to act as the local dog catcher!

Achieving zero carbon

Sadly, I arrived just too late to participate in the ICWES conference but I visited the Engineering New Zealand offices and chatted with their staff. Many of the issues we face in the UK – interesting school children in STEM subjects, recruiting more women and ethnic minorities into engineering and generally promoting how engineering can help achieve net zero carbon they also face but sometimes the smaller population does make influencing easier.

Earthquake engineering exam

One interesting fact I learned about becoming an engineer in New Zealand is that all members from overseas must pass an exam in earthquake engineering. This brought home to me the impact of the natural environment on engineering in New Zealand. Apart from regular earthquakes (Wellington has more than any other place in the world) they suffer from typhoons and tsunamis and the threat of a volcanic eruption is real. The volcanic island I could see from my window was only formed 400 years ago – a mere blink of an eye in geological terms.

Women engineers

I attended an excellent event at Auckland's water utility 'Watercare' organised for their young professional network, which not only looked at women engineers in the water industry, but also formed part of the panel. Generally, there seemed to be more women in technical jobs in New Zealand and I was impressed with the ratio of women at the Water New Zealand conference.

New opportunities

There are huge opportunities for engineers and other technically qualified people in New Zealand. If there is anyone in the UK who is looking for a new opportunity, then life there might be worth considering. Please feel free to contact me if you would like to discuss it further. While it is some distance from the UK, life in New Zealand feels familiar, and you could join the large number of engineers who also rise to the challenge of working in a new country. Many of the well-known large consultants have offices in New Zealand and generally all of them are constantly on the lookout for new staff.

History of our Heritage Manager

Helen Close, the Women's Engineering Society (WES) Heritage Manager shares her very interesting and impactful journey so far.

I joined the staff of WES in 2019, as Centenary Trail Project Officer working on the Heritage Lottery funded Centenary Trail. This investigated and highlighted the role of so many women engineers lost to history and put them back on the map (**https://archive.wes.org.uk/centenary-map**) and onto Wikipedia pages.

Now, almost five years later, I am WES's Heritage Manager, with a more strategic role in integrating the history of WES and women engineers into all that we do.

Helen Close

Helen Close is a Women's Historian and Heritage Manager for the Women's Engineering Society. She has worked on numerous heritage, museum and education projects over the last 30 years. Helen is passionate about discovering and sharing the stories of women lost in the historical record. She has as a degree in history, and Masters' degrees in both Women's History and Heritage Management.

Education

My background is long and varied in research, museums, heritage, education and lifelong learning. I have a BA in History with English, and two Masters degrees. One in Women's History from the University of London, Royal Holloway and New Bedford College, and the other in Heritage Management from the University of Birmingham, Ironbridge Institute. I have found my role at WES has brought all the facets of my past experiences together. I love sharing the knowledge that I have learned, and also learning from what others know. I'm very passionate about sharing histories through community learning routes.

From a family of engineers, prior to my appointment, I had never heard of WES. Why would I? Those who were qualified engineers in my family were men. My mother, who worked in an engineering firm and then ran her own business, wouldn't consider herself as an engineer even though she was, but without the piece of paper!

Women make up 16.5% of the UK's engineering workforce. I'm determined to raise the profile of women in engineering from the past outside the sector itself and to influence some outdated perceptions of women in engineering. I strive to make women's stories commonplace within museums, heritage sites and community venues. "If you can see it, you can be it!"

The history of women in engineering is tangled into the web of mainstream history. The UK in particular, has been fairly poor at telling those stories and until relatively recently, they had been written entirely by men. Which is probably why many of those stories have been overlooked or hijacked!

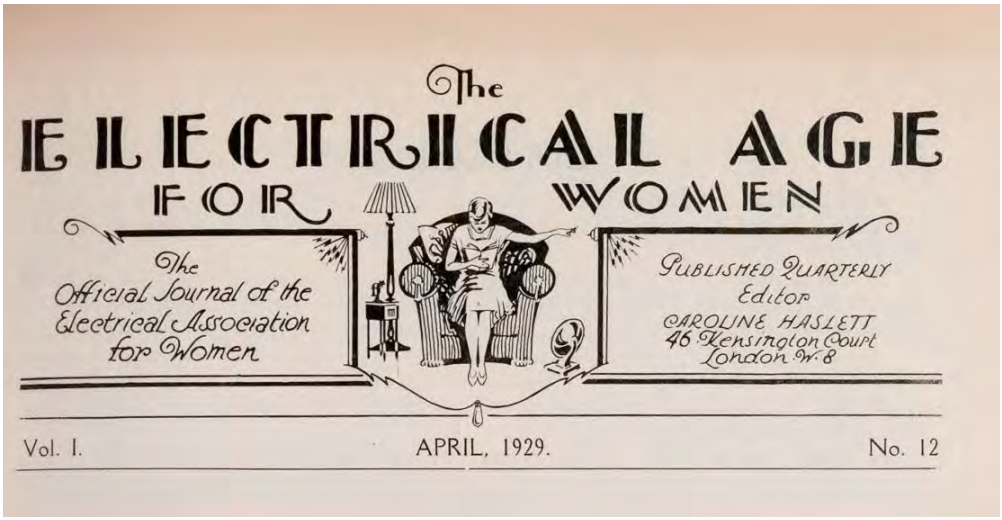
National Curriculum

Where are the women in STEM shown within the National Curriculum? There is a move now, to re-write the pages and redress the balance, fight for equality and equity, but there is still a long way to go.

It's so positive to witness mainstream media picking up on some of these women too. Examples of films such as *Hidden Figures* (Katherine Gobel Johnson, Dorothy Vaughan and Mary Jackson) and *Radioactive* (Marie Curie), but where are the blockblusters on Amy Johnson, Beatrice Shilling, Verena Holmes and Mary Maxwell-Channell? Not only did these women make significant contributions to engineering, they also flew planes, rode motorcycles and raced cars. I'm often approached by scriptwriters and authors writing about these women but when their pitch is made to the powers that be, they are turned down. We still have a way to go to get their stories out there.

Going forward

There are lots of exciting times ahead with various projects planned, along with a desire for more WES members and partners to be involved. Watch this space for more details.



Heritage Open Days Festival 6th -15th September

Once again this year, WES will be taking part in the Heritage Open Days Festival. The theme for the festival is *Routes – Networks – Connections* and as it's the anniversary of the formation of the Electrical Association for Women, (EAW) we will largely be focusing on the role the EAW and its members played in bringing electricity into the domestic sphere and linking with heritage sites across the UK. If you or your organisation would like to be involved, please contact **helen.close@wes.org.uk**

Celebrating the Electrical Association for Women

In today's world, with smartphones, electric cars and all manner of domestic appliances, it's difficult to imagine life without electricity. Pylons, wind turbines and solar panels decorate our landscape, connecting our lives and keep us moving.

But back at the turn of the 20th century, harnessing electricity as an energy source was a new concept. Coal-fired stoves were used for cooking and warmth and candles or gas lighting lit homes and although gas and coal use came with their own hazards, electricity was dangerous, deadly even, if you didn't understand it.

In October 1923, Mabel Matthews a council member of the WES, wrote a paper proposing an Electrical Association for Women, (originally named the Women's Electrical Association). Matthews presented the proposal to the Institute of Electrical Engineers and the Electrical Development Association, both turned it down, stating that they felt the time was not right for such an organisation.

However, the idea caught the eye of then WES Secretary, Caroline Haslett who organised a meeting of the WES in 1924 at which Mrs Matthews presented her paper *The Development of Women's Interest in the Domestic Use of Electricity.*

A 'lively discussion' followed and it was unanimously agreed 'to form a Women's Electrical Association' and the organisation was officially formed in December 1924, with Caroline Haslett as its first Director. Over the coming years the organisation would flourish with branches all over the UK.

Image courtesy of IET Archives

With its slogan of *Emancipation from Drudgery* the EAW produced a journal called *The Electrical Age for Women.* It provided courses, gave the 'woman in the home' practical information about electrical appliances/wiring systems and provided a platform for women to express their point of view on how electricity affected them in the home. It acted as an advisory body to the industry including campaigning for more electrical sockets in the home and the three-pin safety plug that we have here in the UK.

Over the next year WES, along with the IET, will be taking part in the Electric Dreams 2024 Festival to highlight the achievements of the EAW and its members and asking important questions about the role of women and electricity in today's move towards net-zero.

Enviable grant awarded to Women in Engineering

The Royal Academy of Engineering has announced 17 new ingenious awards for public engagement projects designed to inspire the next generation of engineers. The programme is funded by the Department for Science, Innovation and Technology to support grants of up to £30,000.

The newly funded projects will engage communities throughout the UK to help reach underrepresented audiences and change perceptions of engineering. The programme provides engineers with training and encouragement to share their stories and engineering expertise with the public.

This year's projects focus on topics from sustainable agriculture and future sources of water to Formula 1 and the history of women's involvement in engineering. In particular; Watts in A Home – Electric Dreams 2024, which celebrates 100 years of women's involvement in engineering and power in the home, catalysed by the Electrical Association of Women.

PPE survey results 2024

With nearly 1,500 submissions to the WES survey, it's clear that PPE simply does not fit.

This article highlights the results of the WES PPE survey 2024, which demonstrated that PPE is still not 'fit-for-purpose' for women in the workplace.

Background

Since 2009, WES has investigated women's experiences of wearing personal protective equipment (PPE). Research conducted by WES in 2009 and 2016 found most women were wearing ill-fitting PPE, driven by a lack of availability for women-specific equipment.

This newly published report explores the findings of WES's most recent survey on the subject. The survey represents a substantial portion of the female workforce, and in total 1,444 women from 15 different sectors and a range of backgrounds completed the survey.

The findings

The survey found only 4% of respondents reported that their equipment fitted them perfectly. This affects women's ability to complete their work and, as a result, some women alter the equipment themselves or, in some cases, forego it entirely. The lack of appropriate equipment and subsequent alterations can present serious risks, including trip hazards, risk of harm and, in some cases, risk to life. For example, some respondents noted the climbing harnesses, lifejackets or air systems they use do not work for their bodies, thereby increasing the risk they face in their jobs.

There are also substantial effects on women's dignity and ill-fitting, inappropriate equipment causes embarrassment. When women-specific PPE is provided it tends to be pink or purple, causing women to stand out from their male colleagues and, in some cases, leads to being ridiculed. Women said the alterations they make causes their equipment to appear amateur and makes them feel unprofessional, while others said the difficulty removing PPE to use the bathroom and the time needed to do so causes other colleagues to deride them. Some women purposefully drink less throughout the day to avoid this, which itself poses health risks.

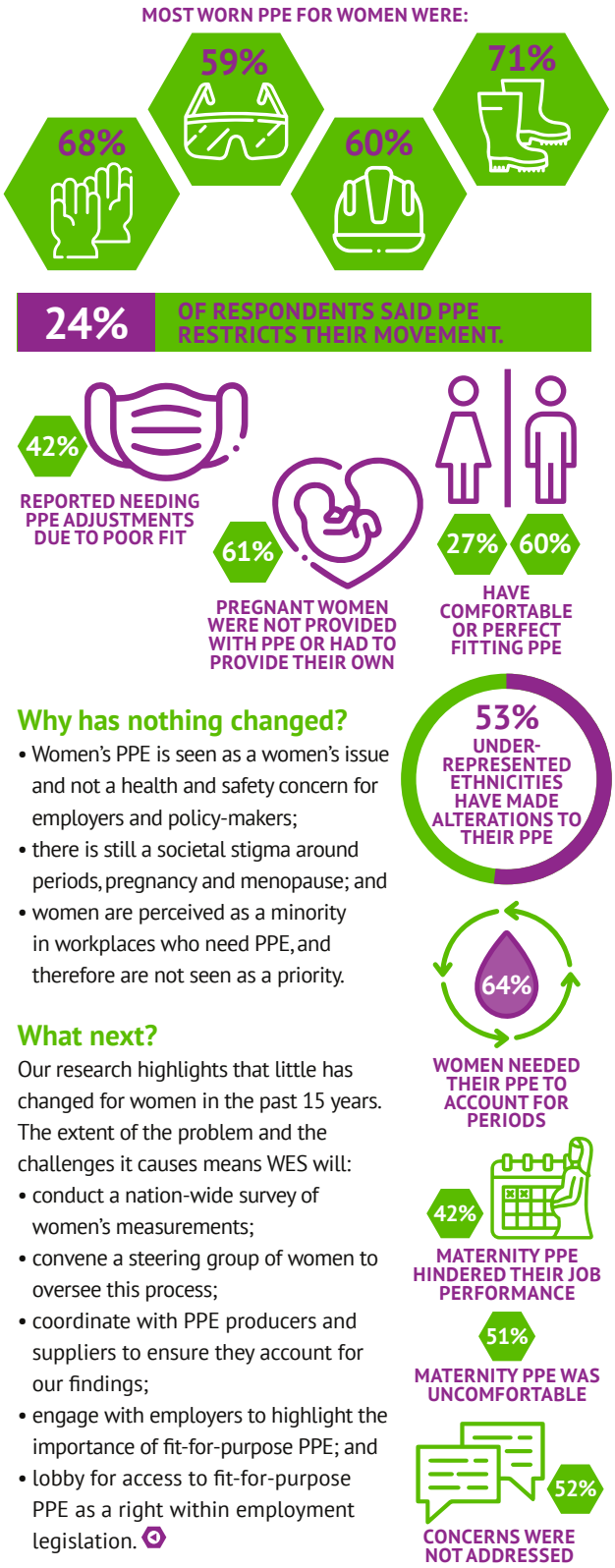
Women also report the equipment they use does not account for the changes in the body occurring during periods, pregnancy or menopause. Some women said the lack of maternity PPE caused them to change roles. There are also challenges for specific groups of women, for example black and mixed race women tend to wear PPE more frequently, spend longer in it, and are more likely required to alter it. Similarly, women with disabilities said their PPE does not account for medical equipment, chronic conditions, limb difference or sensory needs.

Results

The most worn PPE for women were boots (71%), gloves (68%), hard hats (60%) and safety glasses (59%).

However, even these items are moderately restrictive:

- 24% of respondents said PPE restricts their movement. With sense of touch (36%), vision (18%), ability to communicate (11%) and hearing (11%) being the most restricted;
- 42% report having to make modifications to their PPE as a result of poor fit;
- 61% of pregnant women were not provided with PPE or had to provide their own;
- 27% of women (vs 60%) of men have comfortable or perfect fitting PPE;
- 53% of respondents from under-represented ethnicities have made alterations to their PPE, much higher than other groups;
- 64% of women needed their PPE to account for periods;
- 51% found their maternity PPE 'very' or 'somewhat' uncomfortable;
- 42% noted that the maternity PPE provided affected their ability to continue in their role; and
- 68% of women have raised concerns. More than half (52%) of concerns were not addressed.



Why has nothing changed?

- Women's PPE is seen as a women's issue and not a health and safety concern for employers and policy-makers;
- there is still a societal stigma around periods, pregnancy and menopause; and
- women are perceived as a minority in workplaces who need PPE, and therefore are not seen as a priority.

What next?

Our research highlights that little has changed for women in the past 15 years. The extent of the problem and the challenges it causes means WES will:

- conduct a nation-wide survey of women's measurements;
- convene a steering group of women to oversee this process;
- coordinate with PPE producers and suppliers to ensure they account for our findings;
- engage with employers to highlight the importance of fit-for-purpose PPE; and
- lobby for access to fit-for-purpose PPE as a right within employment legislation.

Want to be measured? Want to join the steering group?
Email: **ppe@wes.org.uk** to let us know.
Read the full report at **www.wes.org.uk/ppe**

I have received a lot of emails from WES members praising the redesign of *The Woman Engineer*, and I am delighted that you like it as much as we do. In this edition, we are treated to another batch of terrific articles that I hope will entertain, educate and enlighten you all.

Elizabeth Donnelly, MSc FRSA MRAeS MINCOSE, Chief Executive Officer at Women's Engineering Society

Our woman engineer profile for this quarter is Melissa Ahmed CEng, a chartered engineer and young entrepreneur, running Techwuman Ltd, a design engineering consultancy. Ahmed's experience is a fortunate one. Her parents arranged a variety of placements in different STEM industries, including observing surgery and a civil engineering placement in Sri Lanka. How lucky to have supportive parents who were able to arrange the placements and provide her with encouragement. I meet so many women engineers who have had to explain to their families why they want to study engineering, so it is a joy to read of someone who has had a much more positive experience.

Female role models

The challenge of finding female role models is echoed by Heather Nice in her article on careers in the RNLI, one of WES' partners. Nice is a computer aided design, product data management and configuration manager for the lifeboat charity, and an example of a woman in engineering who isn't an engineer. The RNLI was founded 200 years ago in 1824, and in that time has saved more than 146,000 lives, day or night, on calm seas or in ferocious storms.

One of those lives was my father, who nearly drowned while swimming off the Norfolk coast on a beautiful sunny day when I was around 10. Sitting on the beach with my mum and three brothers, we were unaware of the severe current taking my dad further out to sea. I remember being fascinated by the bright yellow RNLI helicopter that came to his rescue, yet unaware the swimmer was my dad till he returned to our picnic blanket, exhausted and hugely grateful.

Nice's article explains the great work her team does designing and understanding the lifesaving assets necessary to protect seafarers. The work culture is inclusive and recognises the importance of seeing women in senior roles. Nice points out that everyone working at RNLI contributes to saving lives, not just the helicopter and lifeboat crews. This desire to work for a larger purpose is common among women and I encourage companies to make their purpose more prominent if they want to hire more women engineers.

First job as a graduate

Professor Vince Pizzoni, WES Board Director and Trustee, has written a handy guide to getting a first job as an engineering graduate. From applying early – don't leave the application to the day before the deadline because earlier candidates may have applied and been offered the role! – to the follow-up emails after interview, while explaining how to ace an assessment centre. Every tip is golden. Pizzoni offers his decades of experience as an engineering recruiter and this article is truly a cut-out and keep guide for every stage of job-seeking throughout your career. The main takeaway? Learn the STARR model (Situation, Task, Action, Result, Reflection) as a means to answer any question.

Balance and innovation

I'm writing this a couple of days before I go on holiday. It's a welcome pause in a busy year, and I'm sure Kim Groshek would approve. Known as the Pause Lady, Groshek explains how her quest for balance and innovation led her to appreciate the value of taking time to pause. Groshek has a glittering career in banking and information technology: her deployment of a $27 million security project at Associated Bank is merely one of her many achievements. Modern technology serves to take our time and keep us scrolling for the next 15-second hit of dopamine, while pretending that this isn't bad for us. Groshek's article on managing an outstanding career while raising a family and running triathlons, focuses on the need to take time for yourself to balance the stress.

Excitement for women engineers

There's also a report from our fabulous Annual Conference, where nearly 200 women engineers brought their excitement and curiosity to Birmingham, where we also announced the findings from the WES PPE survey. In the 15 years that WES has been asking women about their PPE, very little has changed. This time, though, we mean to make a difference. We're going to measure thousands of women and use the data to design proper fitting PPE. Email **ppe@wes.org.uk** to sign up for measuring and let us know if you want to join the steering group that will oversee a reform in safety wear.

Finally, it's the 10th anniversary of INWED on 23 June 2024 and we are celebrating with a 'Big Weekend'. Head to **www.inwed.org.uk** to find out how you can take part.

Elizabeth Donnelly
Chief Executive Officer of the Women's Engineering Society

www.wes.org.uk

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