





How to build a more neuroinclusive profession

theiet.org/neurodiversity-in-engineering-and-technology

Please note this report was based on a UK study, in different regions of the world there will be cultural variances but many of the implications can be applied globally.

The IET would welcome any comments you may have on the contents of this report, and your ideas for future publications. Please get in touch by emailing inclusion@theiet.org.



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## Foreword



Equality, diversity and inclusion (EDI) are central to our values and beliefs within the IET and across the work that we do. We want

everyone to fulfil their potential and feel that they belong. For us, building an understanding of the extent of neurodiversity in the engineering and technology sector, as well as breaking down barriers, is a crucial element to realising this aim. To engineer a better world, we need to include everyone; we need a variety of skills, expertise and lived experience to drive innovation and creativity.

This new report shines a light on the urgent need to make engineering and technology more inclusive for neurodivergent people. There are no acceptable reasons to stop talented, hard working people from achieving their potential.

Throughout this report we hear that barriers exist for neurodivergent engineers and technicians that people and our environments enable – or sadly more often inhibit – people's

talents from flourishing. As a sector there is much more we can do to truly harness the strengths and skills of neurodivergent people, that will improve the working experience for all.

I am encouraged that this new report highlights what needs to change. I'm pleased that we are learning from and working alongside people with lived experience in our sector. An important initial step in becoming more inclusive, is to get away from the idea that there's a 'right' way of thinking, learning and behaving. We are ready to take the lead on these changes and outline what we will do now as an Institution to improve inclusion of neurodiverse engineers and technicians.

This report also demonstrates that there are actions we can all take to build a more neuroinclusive environment. Engineering a better world is only possible if we have true inclusion at the heart of decision making as well as ensuring it is seen in our actions. We want you to join us in advocating and making this change.

**Katy Deacon MSc BEng CEng MIET**IET Trustee and Chair of EDI Working Party



It's fantastic and very encouraging to see the IET pioneering research into the instance and experience of neurodivergence

in engineering and technology – an area that has remained largely unexplored until now. Throughout this research, we were determined to champion and centre lived experiences of neurodiversity within the sector, and how it can affect individuals in many varied and unique ways.

As a neurodivergent engineer myself and an enthusiastic member of the IET's Neurodiversity Member Network, I was proud to Chair the Advisory Group for this project. The Advisory Group was comprised of a range of exceptional engineers, many of whom identify as neurodivergent, all who helped guide this research and ensure we remained focused on identifying real-life opportunities to incite change and increase neuroinclusion – a big thank you to this group for your invaluable contributions.

We all learned many things throughout our participation in this project, myself included. Importantly, that neurodivergent engineers and technicians bring so many practical, essential skills to the sector, and it's in the best interest of all to support them in identifying and exercising these strengths. Not only will this help us to engineer a better world, but it will also create an industry built on inclusion, collaboration and openness.

**Andy Parker CEng MIET** Chair of Advisory Group

## 1. Executive summary

A 2022 IET survey found that almost one in five people from our IET Volunteer community who responded (19%) identified as definitely or possibly neurodivergent. Later that year we commissioned further qualitative research to build greater understanding and awareness of the lived experiences of neurodivergent engineers and technicians, and to identify how a more inclusive environment could be created. This report presents the findings of that study, drawing largely on insights obtained from a series of focus groups held during the spring of 2023.

The clear message is that there is an urgent need to make engineering and technology more inclusive for neurodivergent people. The reported experience is not, in general, a positive one.

As this report explains, the figure of 19% is likely to underestimate representation of neurodivergence within the sector, which means that many people face significant barriers to being themselves and achieving their potential at work. It also indicates a huge missed opportunity, in terms of exploiting the strengths of neurodivergent people. For employers, failure to create an inclusive environment also represents a direct financial risk, with the number of tribunals linked to neurodiversity on the increase and awards worth tens of thousands of pounds being made.<sup>1</sup>

Around half of the engineers and technicians who participated in the focus groups have a formal diagnosis of neurodiversity. Whether or not they have a diagnosis, however, many say they hesitate to be open at work because they observe and experience a lack of awareness and understanding from colleagues and managers. They know there are risks in speaking up – in terms of stereotyping, stigma and the impact on their career, for example – and often calculate that the risks they face outweigh the benefits.

Neurodivergent engineers and technicians bring many and varied strengths to their work. Too often, however, these strengths are not recognised or appreciated by managers, colleagues or employers.

Not all of the workplace challenges that neurodivergent engineers and technicians have to face are related to the specifics of their neurotype. The challenges they face can be the result of a range of other factors: a lack of awareness and understanding; expectations and definitions of workplace behaviour in which a neurotypical approach is embedded; distracting and noisy working environments; the challenge of accessing workplace adaptations; and the impact all of these have on sustaining good mental health and well-being. Identifying as a member of an under-represented group within the sector, such as being a woman or minoritised ethnicity, often magnifies these challenges.



The good news is that it is clear what needs to be done to build a more neuroinclusive environment in engineering and technology. Participants identified seven key areas where change is needed:

- 1. Treating neurodivergent engineers and technicians as individuals, recognising that different people have different needs even when they share the same neurotype
- 2. Raising awareness and shifting attitudes
- **3.** Building the capacity of line managers to talk with, support and manage neurodivergent people in their teams
- **4.** Integrating neurodiversity into working practices and culture
- 5. Making it easier for neurodivergent engineers and technicians, whether or not they have a formal diagnosis, to access workplace adaptations
- **6.** Offering targeted career support for neurodivergent engineers and technologists where it is wanted
- 7. Enabling neurodivergent engineers and technicians to access and build support.

This report concludes with specific recommendations for action targeted at managers and colleagues of neurodivergent engineers and technicians, at employers, and at external partners. It also suggests ways in which neurodivergent engineers and technicians can better navigate the workplace and achieve their potential, based on insights shared with us through this study. Finally, we make commitments to make engineering and technology truly inclusive for all neurodivergent people.

## 1. Introduction

This report, which presents the findings of new research into the experiences of neurodivergent people in engineering and technology, is unique for three reasons.

1. It provides new insight.

A desk review conducted at the start of the project found that there is very little data available about the experience of neurodiversity in engineering and technology specifically. This study helps to fill that gap.

2. It focuses on the lived experiences of neurodivergent engineers and technicians.

Findings are derived from a small-scale, in-depth, qualitative study, based on the experiences and reflections of neurodivergent engineers and technicians who took part in ten focus groups. (Research methodology is described in Appendix 1.)

3. It shares the learning of those who carried out the research.

The project was conducted by a core team of neurotypical and neurodivergent IET employees and external consultants, working alongside an Advisory Group of largely neurodivergent engineers and technicians. All those involved were transparent and open about the things they learned about both neurodiversity and themselves.

There are several reasons why engineering employers should take note of our findings.

 There are likely to be many more neurodivergent engineers and technicians in the workplace than is currently reported.

Section 2 of this report references a 2022 IET study in which 19% of those who responded said they identified as definitely or possibly neurodivergent.<sup>2</sup> However, in Section 3 we explain how not everyone who is neurodivergent has a formal diagnosis, and that they may not want or need to share their experience, or feel safe doing so.

2. Neurodivergent engineers and technicians do not in general experience their workplaces as inclusive.

One of the implications of this is that engineering employers underutilise the talents of neurodivergent employees. In Section 4 of this report we share insights into these strengths. 3. There is some evidence that engineering employers perform worse than other sectors in terms of neuroinclusion.<sup>3</sup>

In Section 5 we describe the range of workplace challenges faced by participants in this study.

 Many of the changes required to create a more inclusive environment for neurodivergent people will also enhance the employment experience – and performance – of their neurotypical colleagues.

This is a concept known as the 'curb-cut effect'. In Section 6, we describe the changes needed to create a more neuroinclusive environment in engineering and technology.

#### Recommendations

Section 7 presents a series of suggestions and recommendations of ways in which the engineering and technology sector can create a more inclusive environment for neurodivergent people. There are a number of recommendations for employers, managers and colleagues, as well as external partners such as government and professional engineering institutions. We also offer suggestions for neurodivergent engineers and technicians, to help them navigate their workplaces and achieve their potential.

There is a huge opportunity awaiting employers and teams in the engineering and technology sector who are willing to understand and address the needs of their neurodivergent staff and colleagues. We hope this study helps increase awareness and understanding, and galvanises action towards realising that opportunity.



## 2. What is neurodiversity?

'Neurodiversity' is used to describe the concept that "all humans vary in terms of our neurocognitive ability."  $^{5}$ 

In this report we use the term 'neurodivergent' to describe people who identify as neurodiverse and whose neurotypes include:

- attention deficit hyperactivity disorder (ADHD), also known as variable attention stimulus trait (VAST)<sup>6</sup>
- autism or autism spectrum disorder (ASD), which affects how people experience their environment and how they communicate
- dyslexia literally 'difficulties with words'<sup>7</sup>
- dyspraxia or developmental coordination disorder (DCD) - 'difficulties with movement'<sup>8</sup>
- dyscalculia 'a specific and persistent difficulty in understanding numbers'9
- dysgraphia 'impaired writing ability and fine motor skills'<sup>10</sup>
- hyperlexia often associated with autism, a condition where preschool children display an intense early interest in letters in a way that is very advanced for their age and can decode words accurately, but without understanding their meaning<sup>11</sup>
- synesthesia senses which are normally experienced separately are involuntarily joined together, such as experiencing colour when hearing sounds<sup>12</sup>
- Tourette syndrome a neurological condition characterised by involuntary movements and noises<sup>13</sup>.

It is estimated that between 14% and 20% of the UK population are neurodivergent, 14,15 of whom:

- 2-5% have ADHD<sup>16,17</sup>
- 1-2% are autistic<sup>18,19</sup>
- 10%-20% are dyslexic<sup>20,21</sup>
- 5% are dyspraxic<sup>22</sup>
- 1-2% have Tourette syndrome<sup>23</sup>.

These figures relate to the population overall and there is very little data available on the extent of neurodiversity amongst those employed in engineering and technology specifically. A 2022 survey of IET Volunteers (members of the engineering and technology community who are actively engaged with IET activities) found that 9% of those who responded identified as neurodiverse while another 10% said they were unsure if they were neurodiverse. Yange in a report published in September 2020, 'Mapping the UK's Engineering Workforce', regulatory body the Engineering Council estimated that there are 820,000 neurodiverse engineers working in the UK. Yange in the UK. Yange is the extent of the extent

We didn't specifically ask focus group participants to tell us their neurotype, but of those who did, all identified as having singular or co-occurring ADHD, autism or dyslexia. Some participants don't consider themselves to be associated with a specific neurotype, some don't know, and more than half have no formal diagnosis of their neurodiversity. Others who do have a diagnosis chose not to share that information.

## 3. Talking about neurodiversity at work

Engineers and technicians reported very mixed experiences of talking about their neurodiversity at work. Some said they are able to be open, helped by factors such as an understanding employer, a positive relationship with their line manager, being in a senior position, or having a personal motivation such as wanting to improve neuroinclusion more generally. Most who said they are able to be open at work found it brought real benefits.

I'm 100% open with everyone I meet on the basis that it enables things to go more smoothly.

My current boss is good. He knows when I get a bit wonky. If I tell him I need a sick day he gives me time off.

It was good to be listened to and nice to be supported.



However, the majority told us that they hesitate to be open about their neurodiversity at work. This is consistent with findings from other sources.

- An informal survey conducted by a dyslexic engineering consultant on LinkedIn found that of 713 respondent engineers who identified as dyslexic, more than 98% said they wouldn't tell their employers about their condition.<sup>26</sup>
- A cross-sector survey conducted by the Institute of Leadership in 2020 found that the lowest numbers of neurodivergent people talking openly about their neurodiversity came from engineering, manufacturing and construction industries.<sup>3</sup>

Participants gave several reasons as to why they might choose not to speak up about their neurodiversity at work.

## 1. The workplace does not feel psychologically safe enough.

For some, talking about their neurodiversity feels 'too intimate', particularly when there's no evidence that their manager or colleagues are likely to understand neurodiversity or the experiences of neurodivergent people at work. Sharing something so personal can feel risky and anxiety-provoking:
"Just talking about this with my manager would be hard," one participant said.

## 2. Some already have well established coping mechanisms.

The engineers and technicians we spoke with were all either in postgraduate education, actively working or had retired. They have developed the ability to mask their neurodiversity in neurotypical contexts by hiding or adapting their behaviour, and either don't want to draw attention to their neurodiversity or don't see the point of sharing their neurotype.

### 3. They don't see any obvious benefits.

As one person said: "I don't like sharing my 'label'. It's not important, and people generalise from it which is not helpful." Responses may be well meaning, but can often be uninformed, disempowering and sometimes harmful: "The senior manager moved me to the most exposed desk in the office as she thought it would make me engage more with other employees"; "I told my immediate manager and was referred to occupational health. I hadn't chosen that".

## 4. They observe and experience downsides of speaking up.

These can include the stigma associated with being neurodiverse in a neurotypical workplace and the impact on career progression: "They see us as nerds, I know people have said behind my back 'he's just an engineer". Several people explained that they had only felt able to talk about their neurodiversity once they were in a senior position where "they [the employer] need me more than I need them."

In general, it seems that neurodivergent engineers and technicians cannot rely on a positive response to telling their employer, manager or team members about their neurodiversity, and are constantly calculating the risks and rewards of doing so. Many feel able to tell some people and not others, in some circumstances and not in others. Whether they share or not depends on questions such as:

- How well do I get on with my manager at a personal level?
- How well do I get on with my colleagues and peers?
- What have I already observed my employer doing and saying on diversity and inclusion in general, and neurodiversity specifically?
- What do I want and need to be different as a result of sharing my neurodiversity?





## 4. Strengths of neurodivergent engineers and technicians

Research into the strengths of neurodivergent people conducted by Neurodiversity in Business, a business-led forum that helps organisations share industry good practice on recruitment, retention and empowerment, found 80% identified hyper-focus as a strength, 78% cited creativity and 75% reported innovative thinking, with hyperfocus and creativity common across a range of neurotypes.<sup>27</sup> Eleven further strengths included authenticity (64%) and long-term memory (55%).

Most neurodivergent engineers and technicians identified more than one strength that they bring to their work. These fell into five main categories.

- 'Technical' strengths, often related to information processing. Including hyper-focus, multitasking, logical thinking, the ability to acquire technical knowledge, visual processing, problem identification and problem-solving, seeing the detail and the big picture, pattern spotting, and the capacity to summarise.
- Creativity and innovation. The capacity to generate ideas and come at problems from a different perspective.
- Interpersonal skills. Honesty and empathy, and listening skills.
- **Resilience.** Including the capacity to remain calm in a crisis.
- **Teamworking.** "I love teamwork more than anything. I can get stuck in the detail not making progress sometimes, and teamworking helps me with this."
- Working independently. "I'm very good at working alone; I'm very self-motivated".
- Management and leadership skills. The capacity to clarify the task, "get things done," and draw others in. "When leading a design team I make a point of finding the quietest people in the group who often have lots to say but not the confidence to say it".

Engineers and technicians described their strengths as, for example,

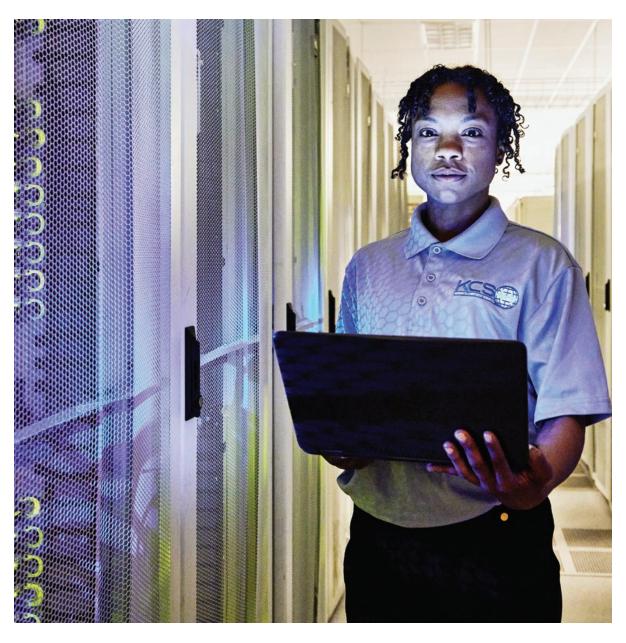
highly stereotypical stuff finding patterns in huge amounts of data.

Others described strengths that run counter to stereotypes:

People often think that autistic people are less empathetic or not as good at communication... but I help people understand each other better.

They also recognised that what might be a strength in some contexts and circumstances may be considered a weakness in others:

In my last job my employer appreciated my strengths, asking questions, arguing strongly, finding solutions. It's a strength in some but not in others.



Whilst most neurodivergent engineers and technicians report strengths linked to their neurodiversity, not all neurodivergent people display the same strengths – and this is true even of those who share the same neurotype. Many don't recognise their own behaviours as a strength. As one said:

I struggle to identify the positives – I need them pointing out to me by my colleagues...
I notice things but I assumed everybody else could do that.

It seems clear that many of the strengths of neurodivergent people contribute to both performance and productivity. One recent study found that neurodivergent employees in certain tech roles are between 90% and 140% more productive than their neurotypical colleagues<sup>27</sup>; another found that teams which include neurodivergent professionals can be 30% more productive than those which don't<sup>28</sup>. However, the people we spoke with commonly experience that their strengths are undervalued. "I have these skills but it's the extent to which organisations value them that's the issue."

Whatever the talents, skills and abilities of neurodivergent people, it is often the behaviour of others and the nature of the wider environment that enables them to flourish in the workplace, or gets in the way.

## 5. Challenges faced by neurodivergent engineers and technicians

Neurodivergent engineers and technicians face multiple challenges in the workplace, only some of which are related to their neurotype. Most often, they are the result of neurotypical norms that define their working environment.

In its survey on neurodiversity at work, Neurodiversity in Business found that the biggest challenge, identified by 78% of respondents, was 'looking after yourself mentally'.28 77% identified concentration, and 70% asking for help. In total, the survey identified 15 challenges.

Our study found five main types of challenges experienced by neurodivergent engineers and technicians:

- challenges that relate to an individual's neurotype
- the behaviour of line managers and colleagues
- the day-to-day working environment
- sustaining mental health and well-being
- and the additional challenges experienced by under-represented groups.



## Challenges related to an individual's neurotype

Our study found a number of challenges at work specifically related to neurodiversity.

- Dealing with complex bureaucratic processes and form-filling, including the professional registration process.
- Difficulties scheduling work, meeting deadlines and procrastinating. Often as a result of being asked to complete tasks that neurodiversity makes challenging.
- **High volumes of reading:** "I've deliberately avoided being an assessor because those panels review up to 20 people in one sitting. That's 150 pages. It terrifies me. But it's hidden. I don't think colleagues realise how difficult it is for me to contemplate reading that much."
- Communicating thoughts and ideas verbally and/or in writing: "It's a challenge to get the information that's inside of me out. I struggle with essays, articles, journals."
- Dealing with emotions: "A lot of my work used to be in negotiations. I got good at that, but it was interesting, as soon as someone tried to play on my emotions, that was extremely difficult for me. I just froze. It took a lot of practice and work with a mentor to overcome that."
- Neurotypical meeting behaviours: "They start talking about a subject. I think about everything I know about that subject, and before I get a chance to contribute they move on. I bring it back to the previous subject but people get frustrated; they say they've moved on. But I need to clear my brain."

 Being assertive: "I try to fit in with what is happening around me, so I find it hard to be assertive and make my own decisions. I'm led by others, then I worry that I'm not really driving myself."

Many of the people we spoke with also described challenges around building relationships at work, often resulting in feelings of loneliness and isolation.

- Social interaction, when "social cues are not my strength" and "I don't see expressions."
- Collaboration. "I'm not so good at that.
   People feel I'm not collaborative, I don't want to be part of a team."
- Dealing with disagreement, such as "how to react when people don't agree with what I say, but I know I'm right."
- Sustaining professional friendships. "I can upset people without having the intention to do so and I won't even know I've done it."

### Behaviour of managers and colleagues

Many line managers and colleagues appear to lack understanding and awareness of neurodiversity, seem uncomfortable talking about difference, or simply don't know what to do or say.

Neurodivergent engineers and technicians told us that they mask their differences, adapting their behaviour to fit into neurotypical expectations of how a 'professional' person behaves and living with a constant awareness of how their behaviour might be interpreted. Masking is exhausting, requiring a lot of cognitive and emotional effort.<sup>29</sup> Ayo Sokale, an autistic civil engineer who has written about his experiences, describes autistic masking as a 'survival strategy' which can in itself lead to burnout and chronic exhaustion.<sup>30</sup>

There are good grounds for concern about career progression: one recent study found that "adults with ADHD... are 18 times more likely to be disciplined at work for perceived behaviour problems, such as fleeting attention span, long periods of intense focus, and difficulty managing time and paperwork; they are also 60% more likely to lose their jobs". Another found that neurodivergent people are often excluded from top jobs due to a 'neurodivergent leadership ceiling' and because they may not be considered a good fit with existing leadership teams. <sup>32</sup>



We heard from several neurodivergent engineers and technicians operating at a senior level, but others were disappointed that they have not been able to achieve their career potential in roles that often don't suit their neurotype. Some said they often found themselves stereotyped as low achievers or constrained by promotion criteria designed for neurotypical people.



### Day-to-day working environment

A brightly lit, noisy workplace can feel distracting and overwhelming for some neurodivergent people. For others, seating arrangements matter a lot, and hot-desking can represent a particular challenge. Location can be important to psychological safety: "I don't like it if I am approached from behind. It shocks me. So I choose to sit somewhere where I can't be approached from behind."

Identifying and accessing appropriate workplace adaptations can be a challenge. Many engineers and technicians experience their organisation's processes as overwhelming and complex. As one explained: "When I asked HR for an adaptation, I was told to go to IT. They passed it to someone else, then someone else, then they questioned if I really needed it. I had to jump through so many hoops, that in the end I gave up."

Responsibility for securing adaptations generally falls on the neurodivergent person which can often feel 'awkward' and off-putting. Not all are aware about the measures that would benefit them or are available. Even those who are reported mixed experiences. Sometimes the process was straightforward, but at other times it was deeply frustrating: "I say clearly what I need but soon everyone forgets. They appreciate what I say, but then two or three months later they forget." This is consistent with another study of the experiences of 181 autistic adults which found that the kinds of workplace adjustments they require are often not understood by employers, or forthcoming.<sup>33</sup>

### Sustaining mental health and well-being

Neurodivergent engineers sometimes struggle to decide whether or not they should seek a diagnosis. Those who do can experience a range of responses. For some, being diagnosed comes as a relief. One said: "It's given me a language, and I now have the weight of disability equality law behind me". Others, however, described the emotional blow of being diagnosed, and having to "reframe my whole history post-diagnosis."

Whether diagnosed or not, the effort to fit into the neurotypical culture of work can exact a significant emotional, mental and physical toll. Many described the stress of being neurodivergent in a neurotypical workplace, and "the sheer effort of appearing normal." Some described feeling lonely at work; for others, anxiety is "in the background, all day and every day."

As one engineer explained: "Anxiety, the fear of being judged or rejected, makes me even more withdrawn."

All these factors are likely to contribute to the fact that engineers and technicians who are on the autistic spectrum have rates of suicide and attempted suicide three times greater than the general population.<sup>34</sup> One study of dyslexic employees found similar experiences of exhaustion, fatigue and burnout, along with chronic fear and indecision about disclosing their dyslexia at work.<sup>35</sup> Maintaining good mental health was definitely a challenge for a number of the engineers and technicians we spoke with.

## Additional challenges experienced by under-represented groups

Challenges at work appear to be magnified for women and people from minoritised ethnicities, who are already under-represented in the industry.<sup>36</sup>

Many neurodivergent women deal on a daily basis with a sense of exclusion in a male-dominated working environment. They feel a double pressure to conform, not just by masking their neurodivergent experience, but also in terms of meeting other people's expectations: "People see me as abrupt and argumentative. I wonder if part of it is that I don't fit the stereotype of how women are supposed to behave."

One young engineer we spoke to said: "I'm the youngest in my team and I'm already stereotyped for that. A person from a minoritised ethnicity explained: "I'm already worried about needing to look like I'm more capable than other people. It would be another negative, different from the norm, not a plus. It would be something else I'd have to overcome at work."

## Building a neuroinclusive environment

What needs to change to create a more inclusive environment for neurodivergent engineers and technicians – one in which they feel they are respected and belong, and that their talents are appreciated, utilised and developed?

- 1. Treat neurodivergent engineers and technicians as individuals. Recognise that different people have different needs even when they share the same neurotype, and that the needs of an individual may change from one day to the next. This means avoiding making generalisations or assumptions, but instead finding ways to ask about and respond to each person's individual and specific needs.
- 2. Raise awareness and shift attitudes towards neurodiversity.
  - a) Learning and development. There is much to do here. According to the Institute for Leadership, only one in five organisations offer training to leaders, managers and employees to support neuroinclusion<sup>37</sup>
  - b) Communications campaigns, and including neurodiversity as a specific focus in work on diversity and inclusion.

    One focus group participant described how an awareness campaign organised by their employer had led them to reflect on their own experience: "I only went for a diagnosis because of autism week at work, and then I realised 'that's my experience too'."
  - c) Normalising conversations about neurodiversity by offering one-to-one conversations and workplace discussions. This was mentioned several times by focus group participants as being key to shifting awareness.
  - d) Identifying colleagues as advocates and allies on neuroinclusion, and building their own awareness and ability to take action.

- Build the capacity of line managers to talk with, support and manage neurodivergent team members.
  - a) Being clear about outcomes.
  - b) Allowing autonomy and freedom in the approach taken to achieving outcomes.
  - Engaging directly with neurodivergent engineers and technicians about their needs, and specifically what they need from their line manager.



- 4. Integrate neurodiversity into working practices and culture of organisations. In practice, this means reviewing how we attract, assess, recruit and on-board new employees to accommodate the needs of neurodivergent engineers and technicians. There is already plenty of comprehensive guidance available from sources such as the Chartered Institute of Personnel and Development on accommodating neurodiversity in all aspects of the employment relationship<sup>38</sup>. The people we spoke to provided specific examples:
  - a) Ensuring that job descriptions are neuroinclusive, using "encouraging language and demonstrating an openness to how the job gets done."
  - b) Adapting graduate programme entry tests to be inclusive, so applicants are not disadvantaged by a focus on "arbitrary skills and grammar." Ensuring performance-assessment tools are neuroinclusive, for example by avoiding the use of neurotypical tests.
  - c) Tailoring jobs so that neurodivergent engineers and technicians have the opportunity to work in areas and ways that suit their neurotype. As one engineer said: 'We need to get better at saying we don't all have to fit a certain role, so I can be open about it rather than me hiding that I don't like collaboration, for instance."
  - d) Gathering and monitoring data on the extent and experience of neurodiversity in the workforce.
- Make it easier for neurodivergent engineers and technicians to access workplace adaptations.
  - a) Raise line manager awareness of some of the basic adaptations often required to support different forms of neurodiversity.
  - **b) Provide a clear point of contact.** Having someone at work who could 'advocate or advise' on adaptations.
  - c) Providing adaptations, whether or not someone has a formal diagnosis of neurodiversity.
- 6. Offer targeted career support to neurodivergent engineers and technicians. This will help them better understand their own and others' neurotypes, their strengths, challenges and needs. It's important that such support is not seen as 'fixing' neurodivergent people, but rather as in addition to broader systemic change.

7. Enable neurodivergent engineers and technicians to access and build networks of support in the workplace and beyond. Many would value an employee network or resource group which brings together neurodivergent employees for networking, mutual support and information. As one participant said:

"We have a mental health group, a Black and minority ethnic group, even a union — but no group for neurodiversity."

## Examples of routine adaptations suggested by focus group participants

- Adjustments to working environment such as "a dedicated quiet space where I can take a break," reducing noise, acceptance of wearing headphones, adapting lighting.
- Provision of IT solutions such as voice-totext technology and visual aids such as mind-mapping tools.
- Memory aids such as using tape recorders in meetings.
- Making written documents more accessible, for example, using fewer words, bullet points and headings, clear text and formatting such as no pictures behind text and use of easy-to-read fonts.
- Adaptations in meetings such as a mix of ways to contribute (verbal and written), breaks, reduced agendas so meetings aren't rushed, inclusive facilitation to ensure everyone has a chance to contribute.
- Flexibility in working arrangements. Working from home or a hybrid mix was a positive for most of those we spoke with; the environment at home is often quieter than in the workplace, there are fewer distractions, less pressure to socialise, and performance improves because "I can be practical and work more efficiently. Something that will take me eight hours in the office takes me two at home."
- Managers and teams taking a more inclusive approach to social activities, recognising that neurotypical socialising (often in large groups, in noisy environments) may not appeal to neurodivergent colleagues.

## Case study:

How employers and employees benefit from a neuroinclusive environment.

## I've been in environments which were not supportive.

- One where I had a manager who thought he was being kind, was giving me space but he was also an echo chamber of my own low self-confidence. Instead of checking in on me and giving me feedback he left me alone and I didn't progress. He was a kind person with good intentions but didn't know how to support me in my neurodiversity so made things worse.
- In another job my ideas were put down, dismissed or ridiculed to the point I didn't offer them anymore. There was little trust and I was constantly worried about stepping on people's toes. I wasn't able to read anything without thinking it was a criticism.

## In my current job the environment really helps me succeed.

- I now have a boss who gives me lots of encouragement, regular feedback, and allows me to brain dump and talk through my ideas.
- I'm trusted to do my job and my knowledge is recognised.
- When I suggest things, my manager works out the impact and priorities and helps me decide if the idea is appropriate at the time.
- She also understands when I'm going to be a bit vague (if I've lost sleep because of my ADHD) and gives me space, because she knows I'm really productive and work hard at other times.
- It's also a real collaboration with my team who trust me to teach them and they share their knowledge with me. I'm no longer stressing about KPIs and if I'm doing the right work and I don't have to waste energy masking.



### As a result

- I can look at the big picture stuff and bring my knowledge from elsewhere. For the first time I can spread my wings.
- One example of this is how I got the weights team involved in checking supply chain and contract documents. All of a sudden we have more visibility for weights management which means if we get problems, we know where they are likely to be and can compensate for them. My involvement means that, unlike our sister project that found out they were overweight when it was too late to do anything about it, our multi-millionpound project has reduced risk of this happening as well as saved money.

### Insights from the project team

The project team learned a number of things about creating an environment in which neurodivergent engineers and technicians would feel safe and enabled to speak up about their experiences.



1. Small is safer. We had a maximum of eight people in each focus group, and often many fewer. Within that we worked with two cofacilitators in two breakouts, so in many cases the conversations were happening between one facilitator and two or three participants.



5. Clarity is important. We learned about the importance of wording questions clearly, sometimes asking named participants directly for their perspective, or inviting contributions in an agreed order, rather than asking a more ambiguous 'what does anyone think?'



2. People contribute through different means. All of the project team meetings and focus groups were virtual, and we arranged them so that people could contribute verbally, or in writing via chat or the Mural collaboration platform. Most often people chose to contribute verbally, but we held one entirely non-verbal focus group.



6. Allow time to contribute.

We learned that some
neurodivergent people may
need additional time to
participate fully, so kept
meeting agendas short.



3. Cameras can be confronting and uncomfortable for some people. Most chose to put their cameras on, but many didn't, and were still able to fully contribute.



7. Take a flexible approach to facilitation. Some neurodivergent people contribute best where there are clear structures and plans whilst others have thoughts that diverge and meander, reflecting the interconnectedness of many discussion topics.



4. Breaks are needed. We built a break into every project team meeting and focus group. Everybody appreciated the breaks irrespective of their neurotype.



8. Sharing the agenda and questions in advance was a unanimous hit. This helped participants prepare before focus groups and meetings, feel safer and contribute more fully.



 Having neurodivergent facilitators who were open about their neurodiversity helped build safety and trust.

# 7. Suggestions and recommendations

In this section we make a number of recommendations for action, based on the insights from the study, targeted at four different stakeholder groups:

- managers and colleagues of neurodivergent engineers and technicians
- employers
- external partners (professional engineering institutions and government)
- and neurodiverse engineers and technicians themselves.

We also commit to actions ourselves to make engineering and technology truly inclusive. We also offer some suggestions for neurodivergent engineers and technicians, to help them navigate the workplace and achieve their potential

We encourage all stakeholders to read the suggestions and recommendations for all groups.



## For the managers and colleagues of neurodivergent engineers and technicians

- Be intentional about raising your own levels of awareness and understanding, and provide support and encouragement for others to build their own. Take proactive steps to understand neurodiversity, how it might show up, and how neurodivergent engineers and technicians experience the world.
- 2. Do what you can to create safe spaces for colleagues to talk about their experience of neurodiversity, if they would like to do so.

  Setting aside time in a peaceful environment and really listening to what is being said are fundamental to a more open conversation.

  Be honest about sharing where you may lack knowledge.
- 3. Respect the right of all people to talk about their neurodiversity experience, or not to. Demonstrate your interest, but don't try to force a conversation. Respect people's boundaries and stay alert to the signals which say 'this is enough'.
- 4. Believe what neurodivergent engineers and technicians share with you. If and when someone wants to talk about their experience, your default should be to believe them, and to state clearly that you believe them. Often, the experiences of neurodivergent people are dismissed or trivialised, sometimes from a well intentioned but misguided perspective. The person talking to you might already have experienced this, so don't betray the trust they are showing in speaking with you.
- 5. Remember to treat every neurodivergent person as an individual, even when you are aware of their neurotype and of the strengths and challenges which 'typically' face someone with that experience.

  Neurodiversity shows up differently in different people, and each neurodivergent person will have unique strengths and challenges that may change from moment to moment as well as from day to day.



## Specifically for managers

- 1. Be intentional in developing your skills in managing a mixed neurodivergent-neurotypical team. You may need to revisit some of your basic management practices such as how to host inclusive team meetings so everyone can participate.
- 2. Be thoughtful about the criteria you are using for recruitment, promotion and performance assessment. To what extent do they embed expectations of neurotypical behaviours? Adapt them where possible to be neuroinclusive, focusing on the desired outputs of the role and allowing flexibility.
- 3. Take a strengths-based approach to the performance management of neurodivergent colleagues, helping them identify and build on their strengths. You may want to consider this approach for all your colleagues of course. In any case, don't expect a neurodivergent person to be able to perform in areas they find challenging.
- 4. Support your team members' requests for adaptations, even where they don't have a formal diagnosis. Work with them to ensure that the adaptations they are given are the right ones for their specific experience.



## For employers

- 1. Make an explicit commitment to becoming a neuroinclusive employer. Work with neurodivergent and neurotypical employees to establish clearly what that means in practice for your own organisation, and to develop a strategy for achieving it.
- 2. Develop a policy on neurodiversity inclusion that makes clear how you will create a neuroinclusive workplace which recognises the rights of employees under the law. Include data collection in your policy, exploring with neurodivergent colleagues how best to maximise response rates.
- 3. Review your employment policies and practices, starting with job design, recruitment, promotion and performance assessment/management. To what extent do they embed expectations of neurotypical behaviours and may therefore be discriminatory? Work in partnership with neurodivergent and neurotypical colleagues.
- Provide opportunities for all employees

   and managers in particular to learn about neurodiversity.

- Provide guidelines for managers and employees on what defines a neuroinclusive working environment and how to achieve it.
- 6. Ensure your IT systems are neuroinclusive, meeting at least a minimum standard whilst also allowing for specific adaptations. Identify and address any barriers to accessing IT tools such as text-to-speech and transcriptions. Simplify access to the specific adaptations that neurodivergent colleagues may require, and don't make access conditional on having a formal diagnosis.
- 7. Develop and make available an evolving suite of adaptations for anyone to access. This could include software, headphones and access to flexible working. Ensure budget is available, including for software licences.
- 8. Create opportunities for neurodivergent colleagues to meet with others who self-identify as neurodiverse, for instance by supporting the establishment of a neurodiversity employee network. Identify and address any additional networking needs, for people of colour or women, for example. Build and train a network of allies on neurodiversity especially at senior levels to help advocate for neurodiverse colleagues and contribute to shifting organisational practice and culture.



## For external partners

- 1. Join us in prioritising action to make engineering and technology inclusive to all neurodivergent talent, now and in the future. As a first step, let us continue efforts to make all aspects of our professional registration processes straightforward for neurodivergent as well as neurotypical applicants.
- 2. Work with us to extend this focus to other professions in the wider engineering and technology community, such as medicine and education. Neurodivergent engineers and technicians interact with many other professions, and together we need to make these interactions enabling rather than disabling.
- 3. Work collectively to progress research in this area. There is much we don't yet know and need to understand. Commit to pursuing collaborative learning in this area as a community of practice, and to holding each other to account for progress.
- 4. Work together with government to make neurodiversity an integral part of government thinking and practice. For example in the work of All-Party Parliamentary Groups.
- 5. Work together to lobby government to remove barriers of time and access to diagnosis, to improve the experience of the Access to Work scheme<sup>39</sup>, and to facilitate the process of accessing adjustments tailored to individual needs. It's clear from the focus groups that changes are needed to enable access to government support, and we all have a significant role to play in terms of advocating for practical and policy change here.



## For neurodivergent engineers and technicians

- 1. Trust your own judgement in deciding if, when and how to get a diagnosis.

  For some people, getting a diagnosis can be empowering and liberating, especially when you retain the choice about how, when and with whom you share this information. However, not everyone wants a formal diagnosis, preferring instead to trust what they know about themselves, particularly as the process of getting one can be time-consuming, emotionally draining and expensive.
- 2. Educate yourself about your rights under the Equality Act (2010). The definition of disability under the Act relates to "substantial and long-term adverse effect" on the ability to "carry out dayto-day activities".40 Being neurodivergent amounts to a disability under this legislation even if a person does not consider themselves to be 'disabled.41 Your workplace should provide any adaptations you need even without a diagnosis, however some employers may require a diagnosis as a condition of providing adaptations. If you have a diagnosis and meet the requirements for disability, your employer is compelled to provide you with reasonable adjustments to help you do your job.
- 3. Consider carefully who you want to share information about your neurodiversity with, how, and under what conditions. You shouldn't ever feel under pressure to tell your employer, your manager or your colleagues about your neurodiversity if it doesn't feel like a safe environment in which to do so. If you do choose to share, make explicit any conditions, for instance around confidentiality. If you share the information with your line manager you may want to check in advance what their obligations are around passing such information onto others (such as your HR team). Consider producing a 'handbook to me' that you can share with your manager and colleagues, describing your strengths, challenges, needs and wants in the workplace.

- 4. Do what you can to build your awareness of and belief in your own strengths, and the contexts in which you are able to best demonstrate them. Be compassionate with yourself about the challenges that your neurodiversity brings, and raise your own awareness of the contexts that magnify and those that minimise those challenges. Be clear about how you can support yourself and what you need from others.
- 5. Look for employers that are proactive and visible in creating neuroinclusive workplaces. Seek out roles and teams where you will be able to utilise your strengths, and avoid those where you may be forced into working in ways that don't fit who you are or want to be. Where roles exist which may require you to work in ways that you find challenging, share your concerns and explore possible solutions. Line managers and employers may be able to make changes to suit you if you're clear about your abilities and negotiate with them.
- 6. Seek out other neurodivergent engineers and technicians for support and guidance. Don't feel you are on your own. There are many engineers and technicians who are openly neurodivergent, and who you can access in your workplace, via platforms like LinkedIn, or through the IET.
- 7. Consider talking about your experiences, particularly if you are in a senior position. If you do choose to become a role model in this way, consider how much and under what circumstances you want to share, and what support you might need. Sharing your experiences with others may lead them to be more open with you and their colleagues. If you're part of an action group or advisory committee you may gain satisfaction from making changes for the whole organisation. However, advocating for change and sharing your story can also be exhausting. Be aware of the emotional and physical symptoms of burnout (such as feeling angry or tearful, struggling to make decisions, or experiencing stress headaches) and support yourself and others around you if you begin to see the signs.<sup>42</sup>



### **Our Commitments**

### As a result of this report, across the IET we are committing to:

- 1. Enhancing neuroinclusion across the IET through improved organisational practices.
- **2.** Ensuring accessibility in our governance processes for increased representation of neurodiverse professionals in leadership roles.
- **3.** Delivering a practical toolkit by Q2 2024 to help foster safe working environments for neurodiverse engineering employees and employers.
- **4.** Offering professional development opportunities to raise awareness of the strengths of neurodiversity within the STEM community.
- **5.** Growing, developing, and supporting our IET neurodiversity network.
- **6.** Advocating for the needs of neurodivergent engineers and technicians; engaging with government and key industry forums to do so.
- 7. Collaborating with other professional engineering institutions to create a more neuroinclusive profession.

This is not an exhaustive list, we will continually review our commitments and report on our progress. We will continue to learn and push ourselves to improve inclusion throughout our Institution.

All of our commitments will be carried out in consultation and collaboration with neurodiverse individuals.

#### How will we do this:

#### Commitment

## 1. Enhancing neuroinclusion across the IET through improved organisational practices.

#### How we will deliver this

- We will continue to listen to and learn from professional registrants to improve the professional registration experience for neurodiverse applicants
- We will continue to grow our pool of professional registration advisors with lived experience of neurodiversity and provide advice and training for others to better support our applicants
- We will continually review our professional registration processes with a particular focus on neuroinclusion
- We will continue our collaboration with the Engineering Council to facilitate the registration process for neurodiverse engineers
- We will continue to grow our pool of mentors with lived experience of neurodiversity and provide advice and training for others
- We will seek out new opportunities to learn how to improve our continuing professional development for neurodiverse engineers
- We will consider universal design right from the initial stages of new product development
- Our user experience architects will listen to and learn from our IET neurodiversity network in how to make our products more accessible for neurodiverse engineers
- We will review our events guidelines to improve inclusion for neurodivergent professionals
- We will respond promptly and compassionately to requests for adjustments from IET members on grounds of neurodiversity

Continued from previous page

#### How we will deliver this Commitment 2. Ensuring accessibility in our - By the end of 2024 we will have reviewed our governance processes, governance processes for including neurodiverse professionals to advise on changes required to increased representation of improve accessibility neurodiverse professionals in - Review the need for specific training on neurodiversity for our IET leadership roles. Trustees and other senior volunteers - We will work with our neurodiversity member network to deliver a 3. Delivering a practical toolkit by Q2 2024 to help foster practical toolkit to support neurodiverse employees and employers safe working environments - We will actively promote and share our toolkit with our members, for neurodiverse engineering volunteers, corporate partners and networks to improve inclusion in employees and employers. the wider sector - Throughout 2024 and beyond we will provide opportunities for our **4.** Offering professional development opportunities colleagues, members, volunteers, partners and networks to learn and to raise awareness of the improve awareness and understanding of neuroinclusion strengths of neurodiversity - We will deliver the first of a series of events to share the findings of this within the STEM community report and practical solutions to improve inclusion in January 2024 - We will deliver a specific element of our flagship 'Inclusive Thinking' campaign focused on the inclusion of neurodiverse professionals - We will seek out opportunities to better inform our colleagues, members and volunteers about neurodiversity 5. Growing, developing, - We will continue to support our IET neurodiversity network and supporting our IET - We will raise awareness of this network both internally and externally neurodiversity network. to enable more neurodiverse engineers and technicians to take part - We will provide spaces and opportunities for neurodivergent engineers and technicians to meet with, learn from and connect with other neurodivergent people in the sector - We will invite colleagues to meet and learn from our IET neurodiversity - We will invite external partners to join network meetings to share good practice **6.** Advocating for the needs of - We will share this report and its findings widely, including but not neurodivergent engineers limited to with the All Party Parliamentary Group for Diversity in STEM, and technicians; engaging government, other Professional Engineering Institutions, and relevant with government and key stakeholders industry forums to do so. - We will encourage employers to improve the experience of their employees, create more inclusive workplaces and to facilitate the process of accessing adjustments - We will encourage government to remove barriers of time and access to diagnosis, to improve the experience of Access to Work, and to facilitate the process of accessing adjustments tailored to individual needs 7. Collaborating with other - We will share this report and its findings widely Professional Engineering - We will utilise our existing networks and seek out new opportunities Institutions to create a more for collaboration neuroinclusive profession.

## 8. About the IET

We are the IET – a charitable engineering institution with over 158,000 members in 150 countries – working to engineer a better world. Our mission is to inspire, inform and influence the global engineering community to advance technology and innovation for the benefit of society.



As a diverse home across engineering and technology, we share knowledge that helps make better sense of the world in order to solve the challenges that matter. It is why we are uniquely placed to champion engineering.

We bring together engineers, technicians and practitioners from industry and business, from academia and research, and from government and the third sector. We are member-led, independent and impartial.

We cover engineering across industries from design and production, digital and energy to healthcare, transport and the built environment. Passionate about healthcare, we bring together expert practitioners from the healthcare industry, academia and third sector.

We champion engineers and technicians working in the sector by offering networking, volunteering and thought leadership opportunities.

## Appendix 1: Methodology

In 2022, we commissioned a study into the experiences of neurodivergent people in engineering and technology that aimed to explore five questions.

- 1. What is known about the extent and range of neurodiversity in engineering and technology?
- 2. What are the benefits for engineering and technology of having neurodiverse professionals?
- 3. What are the challenges faced by neurodiverse engineering and technology professionals?
- **4.** What needs to change to create a more inclusive environment for neurodiverse engineers and technologists?
- **5.** What additional support or adaptations might neurodiverse engineers and technologists need beyond changes to their environment?

The study was conducted by For Business Sake Consulting Ltd, working in partnership with the IET's Equality Diversity and Inclusion (EDI) team. The project was overseen by an Advisory Group comprising engineers and technicians drawn from the IET's Neurodiversity member network and EDI Working Party. Each of the partners in the project was represented by both neurodivergent and neurotypical people.

#### **Desk review**

The project began with a desk review exploring the five questions above, which drew material from two sources: internal (provided by IET relating to neurodiversity) and external (publicly available material on neurodiversity in engineering and technology, including insights from lived experience, trade publications, academia, consulting and support providers).

Sources included documents, reports, web pages and online articles. The review was conducted in January 2023, with the scope of external sources limited in the main to those published since January 2020. In total, the desk review considered almost 70 separate sources and produced a report summarising its key findings.

### Focus groups

An invitation to contribute to the study through participation in a series of online focus groups was sent to all IET members by email, and shared openly across social media with further stakeholders. Ten focus groups were planned and advertised, of which one specifically welcomed minority ethnic engineers and technicians, and one specifically women.

Thirty-eight engineers and technicians (46% of those who had registered in response to the invitation) took part in the focus groups. Participants all self-selected; some had a formal diagnosis of neurodiversity, others did not. There were ten groups in total, and the majority had two facilitators to allow for small breakout discussions. All were hosted using the Microsoft Teams online meeting platform and lasted around two hours, with a break halfway through.

Drawing on the lived experience of neurodiversity amongst staff, the Advisory Group and the external consultants, steps were taken to create an inclusive environment for focus group participants. Use of cameras was optional, and a range of alternatives were offered to contributing verbally, including typing in chat, adding text to a virtual whiteboard and posting pictures. There was one group where participants responded entirely with written contributions.

Focus group participants were sent the discussion questions in advance, giving them time to prepare if they wanted to do so. The questions were:

- 1. What do you need right now to help you feel safe and participate fully in the focus group?
- To what extent have you felt able to be open about your neurodiversity with your colleagues (team, manager), your organisation? Why?
- 3. What strengths do you bring to your role that you specifically connect to your neurodiversity?
- 4. What are the challenges that you've faced as neurodiverse engineering and technology professionals?
- 5. What needs to change to create a more inclusive environment for neurodiverse engineers and technicians where you work?
- 6. What can the IET do to create more inclusive environments for neurodiverse engineers and technicians?
- 7. How did this process work for you? What might we do differently with the other groups?

Each group included at least one external consultant as facilitator and note-taker, and one member of the IET EDI team. Notes were taken in Word and using the Mural application, according to the preferences of the note-taker.

### Sense making and report writing

As a first step in making sense of the insights gathered through the focus groups Mural boards were used, then a joint board mapping key insights. Joint boards were shared and discussed amongst the IET EDI team and with the project Advisory Group. Mural boards provided the basis for the structure and content of the final project report.

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