



The nuclear skills gap and our future diversity

By Sarah Beacock

After several false starts in recent years, it finally feels like the nuclear renaissance is just around the corner for the UK. With the challenges of combating climate change, nuclear could also be the answer for other countries too. But the gradual decline in experienced nuclear professionals over the past 20 years or so has created a problem for the future: the attraction of those with sufficient core skills and knowledge that can take their place.

The industry has made long-sighted efforts to attract new blood in the shape of initiatives such as Nucleargraduates and our very own proactive and enthusiastic Young Generation Network (YGN). Similarly, the industry is fortunate to have its own long-standing professional body in the NI, and one of the very first UK Skills Academies in the National Skills Academy for Nuclear (NSAN), together with a strong academic, vocational and research landscape.

In recent years, the skills landscape has become more fragmented and harder to coordinate and, as a result, successive initiatives have been launched to try and rationalise the range of training, apprenticeships, degree programmes, sponsored academic programmes and sector disciplines across a broad and varied nuclear industry.

Although our own membership figures show a broad spread of members at different ages (see images), there does seem to be an increasing tendency for retirements of high-level staff, often at pre-retirement age. How then to fill this gap to ensure the sufficient supply of knowledge and experience at senior levels?

These issues have been highlighted at successive conferences by the Nuclear Industry Association (NIA), Office for Nuclear Regulation (ONR) and others, where the supply of skills was noted as now one of the biggest limiting factors in the industry being ready to meet the low carbon challenge.

One of the most valuable and successful young talent feeders for the industry is the YGN, a vibrant community for passionate early career (under 37) nuclear professionals. The focus of its mission is to encourage and develop the UK's early career nuclear professionals and ensure their voice is heard in shaping the future of the sector. It offers a variety of opportunities to do so, including talks, webinars, teaching series, technical tours, STEM and educational outreach, alongside flagship events such as the regional and national speaking competitions, annual seminar and dinner and the recent #NetZeroNeedsNuclear campaign led by the YGN at COP26.

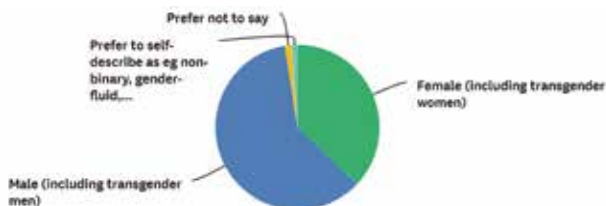
But we have to recognise that often we don't compete well against other sectors looking for the same skill sets and we don't broaden our reach beyond our usual targets and audiences. As a result our recruitment tends to be local and sometimes lacking diversity.

Our Equality, Diversity and Inclusion survey, which we began in 2020, has seen more than 530 people respond, 67% of whom were members of the NI. Engineers, Scientists or Environmentalists that are registered with the NI or other professional body made up 37% of respondents.

A recent analysis of this survey shows the challenges in different a variety of different areas.

GENDER

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Females made up 37% of respondents with those who were NI members being slightly lower at 36%. It is encouraging to see that the women in the industry were responsive to this survey (beyond their known level of representation) and that the gender balance in the NI's membership reflects that in the wider industry. We are working hard to ensure that women are represented at all levels of the NI's governance and structure and that women in nuclear are equally able to achieve professional status to the highest levels of NI membership.

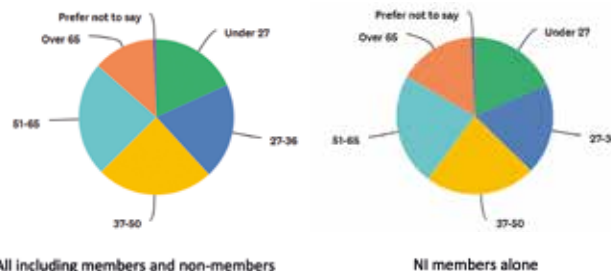
98% have the same gender as was assigned at birth with 1% having a changed gender and a further 1% preferring not to answer this question.



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AGE/CAREER STAGE

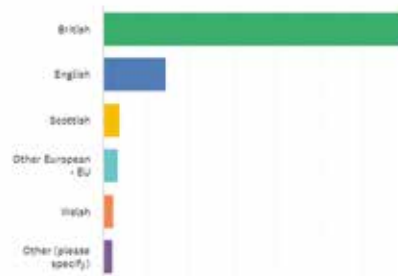
The age profile is reasonably steady in nuclear with a good spread of those at different career stages. This is probably a better indicator of the state of the industry compared to age alone, as we know that many of our members work well beyond retirement age and that age alone is not an indicator of economic activity.



NATIONALITY

The question on nationality revealed a very dominant response as either British or English. This was unchanged between the 'all responses' and 'NI member responses'.

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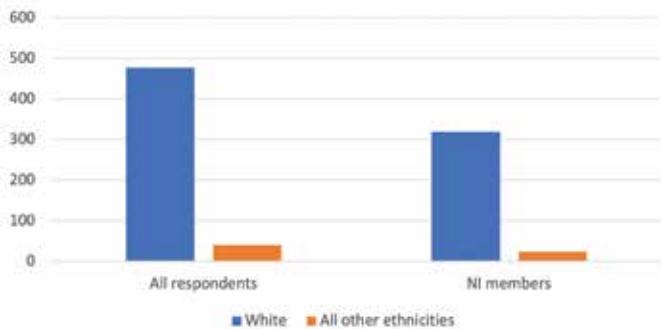
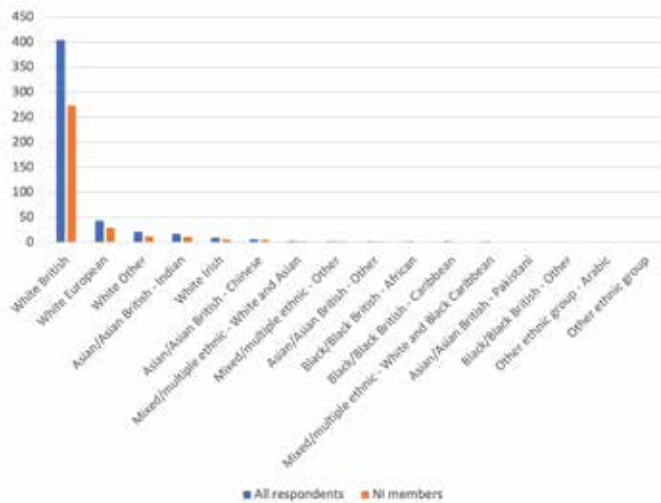


A small number of other nationalities such as from USA, Ireland and India also appeared at around 1% of respondents.

ETHNICITY

Where ethnicity was concerned there was a much wider spread of options with, as expected, White predominating. The table below shows all the ethnicities that scored at least one response. It is difficult to comment usefully on these results given the very small numbers represented from non-white ethnicities and this deserves a wider investigation amongst the whole nuclear population.

Perhaps of more immediate use is a straight comparison of white and non-white representation, which is also shown below. In percentage terms, the non-white proportion of the workforce as a whole responding to this survey was 8.4% compared to 7.5% for NI members. There is clearly still much work to be done by the industry and the NI to improve this.



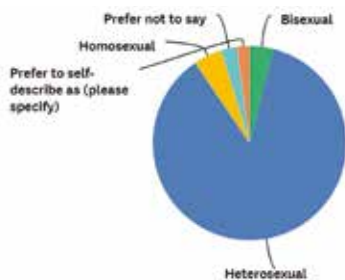
DISABILITY

With regard to disability, 93% of the population consider themselves to have no disabilities with 6.5% identifying a disability.

SEXUAL ORIENTATION

On this question, the difference in the two groups was again marginal. The overwhelming category was Heterosexual.

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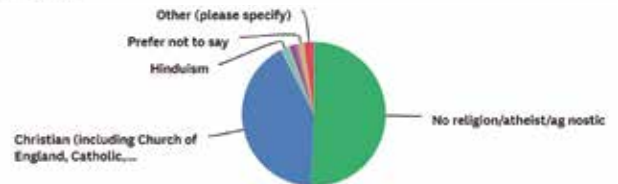


When you remove the number who prefer not to respond to this question the overall percentage of non-heterosexual people in nuclear is 11.1% compared to 11.5% amongst NI members.

RELIGION

This question might have been improved by asking whether answers represented current beliefs, as we don't know if it was interpreted as the religion they were born into. However, in this format it shows a clear split between those with a religion or belief system and those without.

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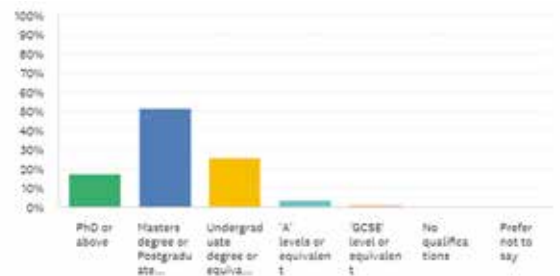


According to a recent YouGov poll some 55% of Britons say they do not belong to a particular religion but 27% believe in a 'God' so our survey falls somewhere between these two positions with the belonging probably the closest in definition (as well as result).

QUALIFICATIONS

It is not surprising that the nuclear industry is well qualified! The results for NI members alone were again similar with a slightly higher number of higher qualifications and lower number of basic qualifications. This stresses the highly technical nature of the industry and the need for highly skilled individuals.

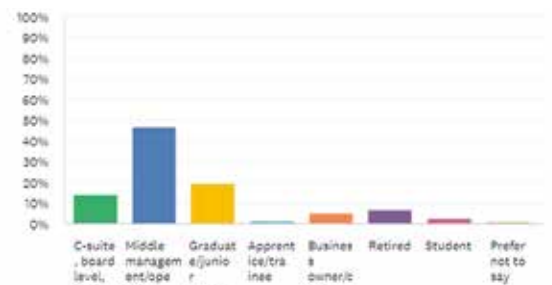
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SENIORITY

Again, perhaps not surprisingly for either the industry or the NI's membership, our respondents are predominantly at the more senior end of the industry – i.e. those with some years' experience. This

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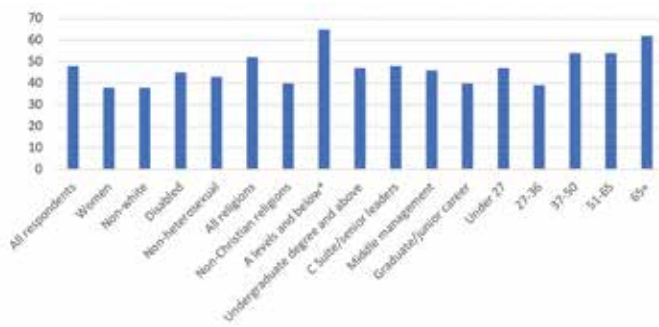


could help account for the relatively low percentage of women and different nationalities and ethnicities. Again, there was virtually no difference between the whole group and NI members, although the small differences that did exist were with a slightly higher percentage of NI members being either a business owner/consultant or retired and slightly lower in middle management.

Our final question was “How well do you think the nuclear industry reflects diversity in your experience?”

This was probably the least consistent or meaningful and would perhaps be better asked in other ways for future surveys. We asked respondents to rate their experience between 0 ‘not at all’ and 100 ‘very well’.

This resulted in a full range of responses from 0 to 100 with the average being 48 and the median 50. Where this data becomes more revealing however is when the individual groups were filtered from the overall result to see the differences as per the table below.



It should be noted that one of the outliers (those with A levels and below) is based on a very small response sample but is included here for comparison with the perception of those with higher qualifications.

Otherwise, it is notable that those where lack of diversity is felt keenest is amongst women, non-white groups and those between 27 and 36 years of age. The data sample is perhaps too small to delve any further into these differences with any real meaning and, as mentioned, a clearer definition to the question would also assist in making this question more meaningful.

Non-heterosexuals, those with disabilities and those in religious groups have perceived fewer diversity issues but again are based on much smaller sample sizes, at least for the first two. In addition there is a notable difference between all religions and non-Christian religions in these figures, although again based on relatively small sample sizes.

SKILLS FOR THE FUTURE

So how does the above information help us tackle the issue of skills shortages?

We already know the business benefits of having a more diverse workforce in terms of better decision-making, greater innovation and increased revenue[1]. There are also the reasons of socioeconomic equality, job satisfaction, morale and CSR. But increasingly, worldwide, in the UK and certainly in the nuclear industry, there is the need to address the issue for the purpose of solving skills shortages. Quite apart from being the right thing to do, it is the essential thing to do if we are going to fill the gaps in skills that are looming for the industry.

With representation in the nuclear industry being lower than in the UK workforce as a whole for both gender[2] and ethnicity[3] there is clearly some way to go in these two key diversity measures. Although less research data exists for other protected characteristics it can be reasonably assumed that similar under-representation exists in other areas.

The UK workforce is almost 50% female compared to the nuclear industry of ‘around 20%’[4]. In writing this article I could find no comparable figures for ethnicity in nuclear so, assuming the results of our survey might be representative, we could say that 8% of nuclear workers are non-white compared to around 19% of the UK workforce.

In my 20+ years working in the energy industry the percentage of women studying engineering has barely shifted. So we might be naïve in believing that we could approach those levels of representation in the near future. However, every effort to shift those numbers will have a huge impact on the availability of people to the future nuclear workforce. The focus on percentages is probably an unnecessary distraction in the overall goal to achieve a wider talent pool and we should not lose sight of that goal – people, not points.

The nuclear industry is not unique in having these challenges but it does have other challenges to overcome such as geography and the high level of most jobs in technology subjects (over 50% are employed at Level 5 or higher[5]). Whilst geography is mostly fixed (SMRs notwithstanding), the investment in STEM for disadvantaged socio-economic groups is a valuable contribution which has already been shown to pay dividends in other sectors[6].

HOW YOU CAN HELP

The NI intends to bring a sharp focus to issues of equality and inclusion in its own activities and in so doing seeks to influence the diversity of the nuclear industry of the future. The setting up of our Equality, Diversity and Inclusion Board to provide advice directly to the trustees will ensure that diversity is a key factor in all our decision-making. By benchmarking our own activities against those of other professional membership bodies in the science and engineering disciplines we hope to foster an environment where diversity is as second nature to us as safety.

Whilst almost all the focus so far has been on women in the sector, and this still remains an important goal with the biggest potential impact for change based on demography alone, we want to widen the scope of diversity to all protected characteristics. We are indebted to organisations like Inclusion and Diversity in Nuclear (IDN) and Women in Nuclear (WiN), who we already work closely with, but widening participation to all under-represented groups is important. We can only do this with your help.

Here are some ways:

- Look at the NI communities you are involved with and identify opportunities to be more diverse.
- Encourage those from diverse groups and communities to get involved directly with us.
- Offer to be a role model for a group that needs more representation.
- Offer to join our EDI Board.
- Help us spread future EDI surveys to get a more accurate picture of the UK nuclear demographics.

I would welcome your thoughts and ideas either directly to s.beacock@nuclearinst.com or for wider discussion on NI Connect.

REFERENCES

- [1] Boston Consulting Group, 2018
- [2] Women and the UK economy, House of Commons Library, 2022
- [3] <https://www.ethnicity-facts-figures.service.gov.uk/>
- [4] Nuclear Workforce Assessment, NSSG, 2022
- [5] NIA Activity Report, 2017
- [6] Accelerating Change: Improving Representation of Black People in UK Motorsport, Hamilton Commission, Royal Academy of Engineering, 2021