

Nuclear Skills Strategy Group

House of Lords Science and Technology Committee

Inquiry - People and skills in UK science, technology, engineering and mathematics

September 2022

Introduction

The Nuclear Skills Strategy Group is the UK-wide employer-led nuclear industry skills lead and provides 'one voice' to government.

Members include:

- Major employers in the nuclear sector.
- Government departments responsible for nuclear development and skills leadership
- Trade unions in the nuclear industries

The NSSG represents both the civil and defence nuclear sectors, and its strategy addresses the skills infrastructure, processes, and the training provision needed to secure the required supply of qualified and competent people.

Please note: This response is provided from the employer members of the NSSG, and not those representing government departments.

Responses to the Committee's questions:

Q1 – International Talent

Within the UK nuclear sector, it can be hard to attract international talent. Global businesses have long recognised the UK's strong skills base and outstanding track record in innovation as a primary driver of their investment decisions. However, the UK is now facing increasing competition from other countries.

Challenges include:

- the perceived requirement for nuclear employees to be nationals of the UK and the need to have five years' residence in the UK to gain security clearance to work
- uncertainty over UK energy policy for nuclear means that it is difficult for the sector to ensure job security and/ or provide attractive job propositions for high-skilled international talent to move to or work in the UK nuclear sector
- salaries for high-level skills in nuclear in the UK are often lower than other countries such as USA and Canada, hence it can be difficult to compete to attract talent

We have no evidence that Brexit has made this any more or less difficult, but the free flow of global STEM talent is vital to meet the needs of the UK nuclear industry.

A small number of specialists have left employment in the UK, seeking nuclear new-build programmes, research and development opportunities in the Middle East, USA, and Canada. The speed and timing of nuclear commissioning in these countries is greater than the UK and salaries can be more attractive. Some of these individuals' skills are applicable to all industries (wider than STEM) and hence they are highly sought-after particularly in technology, engineering and project management.

Incentivising individuals to return to the UK who have trained here and have worked overseas for a while, may be beneficial to our sector. Not only does the experience they gain overseas help to increase knowledge, but it provides continuation of interest in a specific discipline area, increasing expertise for the benefit of the sector.

Q2 - STEM skills

Nuclear employers report difficulty in recruiting in:

- Engineering disciplines; particularly nuclear engineering, civil engineering, industrial architecture, systems engineers, mechanical engineers, design engineers, control & instrumentation engineers, and safety case engineers
- Nuclear reactor operations
- Material Science
- Computational modelling
- Non-destructive testing
- IT disciplines such as systems architecture
- Experienced specialists in the STEM fields who are able to apply their skills to project manager disciplines

These roles are hard to fill with high-calibre talent at present and there does not appear to be enough early careers people specialising in these disciplines to ease labour demand in the medium- to long-term future.

Employers have noticed a widening of the scope covered in several degree courses, so in some cases graduates are joining industry with broad (rather than deep) knowledge in their specific discipline, depending on whether they have undertaken a modular course and/or a hybrid degree.

Variation in academic content means that when new graduates start employment, employers sometimes must provide them with sufficient technical training and guidance.

Post-doctoral level - Centres for Doctoral training provide a broader and better grounding in what is involved in a career, preparing researchers for the fact that they probably will not stay in the same role for the rest of their careers.

There are opportunities for people to develop STEM skills across multiple disciplines. For instance, in areas such as robotics and artificial intelligence the need for knowledge of engineering, computing skills as well as materials science is important and there are many examples of new areas which are emerging which are essentially a hybrid of numerous STEM areas.

In the nuclear industry, providing easier access to nuclear facilities and active demonstration facilities to carry out research would allow individuals to train in realistic environments that enhance skill development and provide opportunity for both industry and academia to work collaboratively to advance understanding and develop new solutions to industry challenges.

There is a need for investment in facilities and programmes to develop high-level STEM skills across academia and industry

Q3 - Education sector

Employers in the nuclear sector find that there is poor awareness amongst young people of the array of STEM careers in the UK, and this is often mirrored amongst science teachers. We are told that students perceive STEM subjects at school to be “hard” and hence there appears to be less uptake of students taking all STEM subjects at A-level (or equivalent).

Degree apprenticeships are popular in the nuclear sector and employers believe it is important to retain full degrees within them, to maintain parity with academic graduate routes. There should be no narrowing of content to ensure breadth and depth of knowledge for STEM industry entrants choosing this route.

Cultural influences, social media and influencers have a huge impact on young people. Nuclear employers feel that these media could be better utilised to educate young people on STEM subjects and the attractiveness of a STEM career. There is scope for collaborative efforts covering multiple sectors.

Diversity and inclusion – the nuclear sector is working hard to address issues of diversity and inclusion in its workforce. Addressing skills and recruitment gaps must include this issue so that the best talent is not artificially deterred from suitable careers.

T Levels are a potential route to addressing STEM skills pipelines, but nuclear employers are concerned that there must be suitable flexibility on employer-led, high-quality simulated placement elements. These will allow for geographical gaps to be addressed, and for employers to engage where there are barriers to young people accessing restricted sites. Existing qualifications should not be withdrawn from public funding until T Levels have demonstrated that they are well-embedded as an alternative.

There are several retraining schemes available, but knowledge of these is low and there are quite specific criteria around eligibility. Centralised information would enable candidates to compare options.

Professional institutes could play a greater role in educating and inspiring young people as future talent for the STEM workforce.

Q4 - Quality of academic careers

Employers in the nuclear sector report that in the Higher Education sector, the pursuit of scientific excellence takes priority over a broader national economic need for certain skill sets or research. Every five years, universities must re-compete for funding for their Centres for Doctoral Training (CDT) and the criteria used for PhD candidacy as set out by the EPSRC do not take into consideration any economic or nationally significant needs.

The structure of academic careers can be difficult to understand for those outside of the higher education sector. They have changed significantly with the requirements of teaching and research needing to be balanced. Engaging with the international academic sector can also be additionally challenging, especially due to eligibility around research sponsorship.

Nuclear employers find that salary discrepancy between industry and academia is high and there is often poor job security for researchers, who may be on fixed-term contracts directly tied to a specific research project.

Public investment in long-term skills needs, based on sectoral labour market intelligence would be beneficial. Some specialist skills are not in constant demand and therefore there are gaps in the workforce entailing risks of shortages as people retire.

The nuclear sector spent some time developing an apprenticeship at PhD level, before this was prevented by ministerial policy. Such an arrangement has the benefit of aligning research with industry needs and offers practical experience and stability to early career specialists.

Investment in exchanges of expertise between industry and academia would be beneficial. They are currently few, and hence tend to be highly competitive. The same applies to opportunities for research fellowships, etc., with organisations such as the Royal Society.