Nuclear Institute response to Industrial Strategy - Skills Pillar

Area of Concern	Proposed Government Interventions	Consultation Question(s)	NI Comment/Response to Consultation Question(s)
1. Action to improve basic skills			
Actions to support FE colleges to be centres of excellence in teaching English and maths will be explored. Through the Post-16 Skills Plan, a 'transition year' will be put in place at age 16 for students who have substantial basic skills gaps and are not ready for more advanced study or employment. This aims to provide intensive support in basic skills for those who need it most and reduce the numbers of young adults at risk of leaving full-time education without the skills needed for employment. The Institute for Apprenticeships and Technical Education will help to determine what digital content will be included in the new technical education routes.	• We will explore how to **support further education colleges to be centres of excellence in teaching maths and English**.	Q10. What more can we do to improve **basic skills**? How can we make a success of the new transition year? Should we change the way that those resitting basic qualifications study, to focus more on basic skills excellence?	Literacy, numeracy and digital skills underpin the ethos of nuclear professionalism which the NI promotes in all our members. Accordingly, the NI supports the government's aspiration to improve basic skills attainment so as to match the standards achieved by high-productivity countries. However, the NI firmly believes that prime responsibility in this area lies with *schools* rather than FE colleges. Accordingly, the Government must do more to make basic skills teaching, and STEM subjects in particular, in schools an attractive career option for talented engineers, scientists and mathematicians and this should be funded appropriately. The IS paper makes the point that too many FE colleges focus on low-level basic and generic qualifications at the expense of the higher-level (Level 4+) technical qualifications required to develop advanced technicians – an area of critical shortage in the nuclear industry. The NI believes that making FE colleges responsible for basic skills delivery is inconsistent with the aspiration to raise the level (and quality) of technical education in colleges. We support the concept of the 'transition year', but to be effective, this relies on talented, inspirational teachers with specialist skills capable of contextualising basic skills training to the real world of work– thus stimulating learner motivation. Given there is a significant shortage of such teachers already, we believe government would have to channel more resources into teacher training in order to underpin and make the 'transition year' successful.

2. The creation of a new system of technical education

a. Clear, high quality routes for technical education A clear, simple framework of high standard qualifications that enable progression up through different skill levels and into skilled employment is needed. Following the review, led by Lord Sainsbury, 15 core technical routes will be created which will be defined through rigorous labour market analysis. It will be essential for routes to be led by employers to meet the needs of the industrial strategy.	• We will create a **proper system of technical education**, to benefit the half of young people who do not go to university and provide new, better options for those already in the workforce. This involves creating a small number of high quality new routes, as set out in the Skills Plan, and attracting more industry specialists to work in the sector to raise the quality of higher skills training.	Q11: Do you agree with the different elements of the vision for the new **technical education system** set out here? Are there further lessons from other countries' systems?	The NI generally supports the various interventions set out in the government's Post 16 Skills Study, all of which has been subsumed into the Industrial Strategy Skills Pillar. While UK universities continue to perform well in international rankings, the NI has particular concerns that FE provision in the UK has is not fit-for-purpose, especially in the STEM disciplines. We believe the fundamental enablers to improving FE provision are related to the quality of leadership in FE providers and the ability to attract, recruit, develop and retain highly-talented, inspirational instructors with specialist skills and real industry experience. The NI would therefore support any initiative which enhances the skills base within the FE sector. We concur with the government's view that the range of FE provision has become complex, confusing and often of questionable value. We therefore welcome the proposal to rationalise provision into a smaller number of core technical routes. The specification of the content of these technical routes – i.e. what forms the core knowledge of each discipline – will be key to the success of this approach and will need close liaison between employers and providers. We also believe that there must be sufficient flexibility and innovation around the core syllabus to introduce sector-specific topics – e.g. nuclear. We also believe that there must continue to be flexibility around delivery models to include both full-time and part-time options and modularised approaches. The intent for all non-apprenticeship classroom-based technical training programmes to include work placements is strongly supported, but this will need to be adequately resourced. We believe that employer-sponsored full-time, classroom-based provision with work placements could be an attractive alternative to apprenticeships for some employers. We would therefore urge the government to reconsider the funding rules around use of the apprenticeship levy in order to allow employers greater flexibility in allocating their levy pot to different types of provision; this parity of funding treatment between technical education and apprenticeships would be consistent with the parity implied by the formation of the Institute of Apprenticeships and Technical Education.
b. High quality technical education providers with excellent teaching The new technical routes and expanding apprenticeships, especially at higher levels, will increase the need for excellent teachers who have a strong industry background and high-level specialist and technical knowledge. Ways to attract more industry specialists to work with and in the sector to increase the quality of training will be explored.			

c. Higher level technical education and new Institutes of Technology in all regions The Government recognises that it needs to do more to stimulate provision at higher technical levels and make the infrastructure available to support this teaching. The Government has committed £170 million of capital funding to support the creation of new Institutes of Technology. The institutes would be expected to: specialise in technical disciplines (such as STEM) that are aligned to technical routes; offer high quality provision at levels 3, 4 and 5 and have a local focus to deliver qualifications of value that meet the skills needs of local employers.	• We are committing **£170m of capital funding to the creation of prestigious new Institutes of Technology** to deliver higher technical education in STEM subjects and meet the skills needs of employers in local areas.		We give qualified support for the introduction of Institutes of Technology (IoTs). Our qualifications are that (i) IoTs should be *real* rather than *virtual* organisations (ii) they should be new entities rather than loose affiliations existing providers and (iii) they should offer discipline-specific education rather than sector-specific training. The nuclear sector already has a National Skills Academy for Nuclear (NSAN) which is not actually an academy and a National College for Nuclear (NCfN) which is a virtual entity formed from pre-existing training providers offering courses which pre-date their establishment. Our concern is that if IoTs may be formed from existing training providers as a means of pulling down capital funding– who then continue with exactly the same educational offer. This should NOT be tolerated; IoTs must add real value to the FE sector. Also, as stated above, our view is that the FE sector desperately needs to increase the number and quality of instructors capable of teaching at Levels 4+; our concern is that the IoT initiative – in providing capital rather than operational funding – will not address that fundamental enabler. We support the aspiration to promote parity of esteem for 'academic routes' and the 'technical routes'. However, we are concerned that the rhetoric and terminology creates the impression of two mutually exclusive alternatives. The reality is that all routes include both to some degree – and there must be options to transfer from one to another. A less discriminating terminology is therefore, required.
d. Ensuring Technical Education routes are demanding The Government will review how to best to drive up quality and make new routes more demanding.			The NI believes that driving up quality of technical training in the FE sector in order to give parity of esteem with academic routes, will require outstanding leadership within the FE sector and the resources necessary to select, recruit, develop and retain highly-talented and inspirational trainers. While the strategy makes reference to 'attracting more industry specialists' into teaching, there is no indication of how this will be achieved. Interventions which do not address these key enablers are likely to prove ineffective in the longer term. Capital investment in facilities and equipment is important – especially given the rate of technological change - but making such investments without parallel investment in human resources is likely to be ineffective.
d. Creating a course-finding process for technical education similar to the UCAS process It is necessary to explore how to give technical education students clear information and better support throughout the application process, with a similar platform to UCAS, which will also make it easier for students to compare options in technical education and higher education.	• We will explore how to give **technical education learners clear information**, which could include a way of searching and applying for courses similar to the UCAS process.	Q12: How can we make the **application process** for further education colleges and apprenticeships clearer and simpler, drawing lessons from the higher education sector?	The NI supports all initiatives which will improve the information, advice and guidance (IAG) available to young people and their influencers on the range of education and training opportunities available throughout the UK. In the case of Higher and Degree Apprenticeships in particular, we believe that they should be promoted on a *national* as well as local basis in order to address skills shortages in particular areas - especially regions where insufficient numbers of young people are coming through the local education system to meet the future skills demand. Employers and training providers may also need to consider how higher and degree apprenticeships can be offered on a residential basis in order to allow trans-regional uptake.

3 Addressing STEM shortages

The Government has committed to make Britain the best place in the world to study maths, science and engineering. There is evidence of increasing demand in STEM subjects within higher education, with UCAS acceptances for full-time undergraduates in these subjects growing by 19 per cent between 2010 and 2016. There is currently a subsidy paid to higher education institutions via Higher Education Funding Council for England (HEFCE) to incentivise provision of high-cost, mostly STEM subjects. To deliver a world-class industrial strategy it will be necessary to encourage the education sector to increase opportunities to grow STEM subjects further.	• Professor Sir Adrian Smith's independent review of post-16 mathematics will propose measures to improve take up of mathematics and **close large regional imbalances in take up of advanced mathematics.** • We will consider how to enable the specialist maths school model pioneered by Exeter and King's College London to spread. We will seek partners to open mathematics schools of this kind across the country. • We will explore further encourage the uptake of STEM subjects to help meet unmet demand and build on the growth of recent years.		The NI supports all interventions aimed at improving levels of achievement in STEM subjects. We believe that STEM teaching in schools would be enhanced if teachers had more real-world and industrial experience. In the case of mathematics in particular, our experience is that young people often become more interested in the topic when they realise that application of mathematics solves real problems (e.g. in product design) in a more efficient, time-effective and accurate manner; in short, when they begin to see mathematics as a useful problem-solving tool. Too often in schools, maths is taught in the abstract and is therefore perceived as an academic exercise with no real practical application, designed simply to challenge learners; inspirational teaching of the topic using real-life work-based examples will require teachers with knowledge, practical experience and inspiration. We believe that initiatives should be developed whereby STEM teachers can gain industrial experience in order to contextualise their teaching. A more radical approach would be to redevelop and rename teacher training programmes as *apprenticeships* with both teaching experience and industrial work-based experience as mandatory elements. As all teachers would themselves be time-served apprentices, they might be in a more informed position to promote apprenticeships and technical training routes as being of equal merit to traditional academic routes.

4. Identifying and addressing sector-specific skills gaps

There are acute and urgent skills shortages in key industrial sectors including infrastructure and the nuclear industry. The UK Commission for Employment and Skills (UKCES), the Low Pay Commission, the Migration Advisory Committee, and individual sectors have produced assessments focused on their specific remits. But no organisation has been tasked with identifying persistent or emerging sector specific gaps and proposing action. Therefore, a single, authoritative view of the gaps faced by the UK now and in the future is necessary	• We will work towards a **joined-up, authoritative view of the sector specific skills gaps** that the UK faces now and in the future. • We will take further actions to **address differences in skill levels between different areas** to help drive economic growth and opportunity throughout the country (explored in later chapters of this paper).	Q13: What **skills shortages** do we have or expect to have, in particular sectors or local areas, and how can we link the skills needs of industry to skills provision by educational institutions in local areas?	The NI would draw the government's attention to the work of the Nuclear Skills Strategy Group (NSSG) and, in particular, the Nuclear Skills Strategic Plan which we completely endorse. This summarises the various labour market research and skills gap analyses already undertaken for the nuclear sector and sets out a series of actions which will mitigate the problems. It is not appropriate to address these here; however, the NI believes the government should intervene wherever appropriate to realise the objectives set out in the Nuclear Skills Strategic Plan. In addition to the priorities set out in the Nuclear Skills Strategic Plan, the NI has identified Radioactive Waste Management, Digital (including Building Information Management) and development of Small Modular Reactors (SMRs) as areas requiring significant interventions to develop skills, promote careers within the sector and increase public understanding. These issues are covered in detail in a separate response document to be submitted by the NI. The NI is concerned that some areas of the country (e.g. Cumbria), where major nuclear developments are planned, have significant demographic issues which will exacerbate skills shortages. In order to address these issues, employers will need to be able to recruit both nationally and internationally. The UK's decision to leave the EU has the potential to impact negatively on the nuclear sector which has historically benefited from EU graduate-level recruitment. The NI therefore urges the UK government to ensure continued access to this source of skilled labour post Brexit.

5. Higher quality careers information and advice

The Careers & Enterprise Company's Enterprise Adviser Network is live – connecting 1,300 schools and colleges with local employers to provide experiences of the workplace for young people. The Government will consider what more can be done to involve businesses. Careers provision continues to be patchy and inconsistent – both in schools and in later life. The Government is reviewing the current	• We will publish a **comprehensive careers strategy** later this year to radically improve the quality and coverage of careers advice in schools and colleges, to make it easier for people to apply for technical education, and to give people the information they need to access training throughout their working lives.		The NI welcomes the intention to review the strategy around careers advice in schools. We understand that central funding from DfE for the careers advisory service has been withdrawn and that the financial burden now falls on schools. Not surprisingly – and our members confirm this in their interaction with schools as STEM ambassadors – there has been a significant deterioration in the quality of careers advice. Our view is that the role of schools careers advisor should be recognised as a profession requiring dedicated, highly-skilled, well-informed personnel with a good understanding of labour markets, employer requirements and training opportunities, and that this service needs to be reintroduced and adequately resourced.

careers offer for people of all ages, and will build on international evidence to publish a comprehensive strategy later this year for careers information, advice and guidance.			The NI also feels that school performance indicators need to be realigned so that schools gain credit for student progression into apprenticeships and technical training as well as the traditional university route. Unless and until school performance indicators and rankings give parity to academic and technical progression routes, schools will continue to prioritise the university route in their information, advice and guidance to students. There is also increasing evidence that the continued focus on schools' performance relating to the achievement of the 'English Baccalaureate', is having a detrimental effect on other GCSE attainment, especially in technical subjects including Design Technology and Engineering. The NI therefore urge government to consider the introduction of the 'Technical Baccalaureate' as an alternative measure, especially if delivered by one of the new University Technical Colleges being developed around the country.

6. Testing new approaches to lifelong learning

The increasing pace of technological change means it will be increasingly necessary for people to retrain during their careers. To connect more people to opportunities to retrain, new approaches to encourage lifelong learning will be tested, which could include direct outreach with business people, particularly where industries are changing or in decline. The use of 'contact moments' people have with the Government will be trialled to promote opportunities to retrain and the role of community learning centres will be considered. The option to introduce maintenance loans for higher technical education, of the kind the Government already supports in higher education, will also be reviewed. How to bring together information on training opportunities, costs, government support and likely employment benefits, in order to increase take-up of skills training will also be explored. This will include better signposting and promoting online training that can be accessed as needed by users. As part of the Government's higher education reforms, promotion of opportunities for students to transfer between courses and institutions will also be explored. Opportunities to transfer offer more options for students wishing to continue with their studies later in life and will contribute to raising higher level skills among people of all ages.	• **We will explore ambitious new approaches to encouraging lifelong learning**, which could include assessing changes to the costs people face to make them less daunting; improving outreach to people where industries are changing; and providing better information.	Q14: How can we enable and encourage people to **retrain and upskill** throughout their working lives, particularly in places where industries are changing or declining? Are there particular sectors where this could be appropriate?	The NI – like most Professional Engineering Institutes (PEIs) – promotes continuous professional development in our members as a means of expanding career opportunities. We would like to see more employers – and government could lead here - mandating professional qualifications (e.g. EngTech, IEng and CEng) for key job roles as a means of promoting the highest levels of professionalism. In addition, we would recommend that certain training programmes (e.g. higher and degree apprenticeships) include professional registration as a mandatory element of the programme. While many such programmes are aligned with the Engineering Council competence frameworks – and indeed many programmes are accredited to that effect by PEIs – the reality is that only a small proportion of individuals actually register on completion of the training. As a result, those individuals do not set out on the CPD path which professional registration would require. As already discussed, the nuclear industry is likely to expand considerably in the future and the skills gap will need to be partly made up from transferees from different industrial sectors. The important point here is that nuclear is a *sector* – not a *discipline.* The nuclear sector requires the same broad range of technical skills as many other high-tech industries – mechanical, electrical, C&I, chemical, ICT, quality and safety engineers, project managers, etc., with a much smaller number of personnel with nuclear-specific skills e.g. reactor physics, radiation protection. To that end, we need to deal with the perception that nuclear is somehow different and more demanding than other safety-critical industries. It is not. The NI has taken steps to address this issue in defining the 'Nuclear Delta'; i.e. that body of knowledge, skills, attitudes and behaviours that personnel should develop in addition of their primary discipline, in order to work safety and effectively in the nuclear sector. The NI will continue to refine this concept in order that training course material can be designed to develop these attributes for both first-job entrants and inter-sector transferees.