VALUING THE ROLE OF TECHNICIANS

POWERING EDUCATION
ENRICHING LIVES

Briefing Paper

September 2009

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The New Engineering Foundation (NEF) is an independent and strategically focused charity (registered in England number 1112354) that works with key partners and stakeholders to support the advancement of education for the benefit of the public. It was established in 2004 as a grant awarding charity and a think-tank that supports vocational Further Education in Applied Science, Engineering and Technology through:

- Research, Policy and Advocacy;
- Programmes and Resources; and
- Knowledge and Technology Transfer.

Our mission is to achieve measurable and visible improvement through collaboration and partnership by providing a shared vision which:

- Engages all the key national and regional stakeholders;
- Enriches teaching and learning professionalism;
- Enhances and develops the capability of individuals , providers and industry; and
- Empowers change in individuals (teachers, trainers and tutors), providers and industry.

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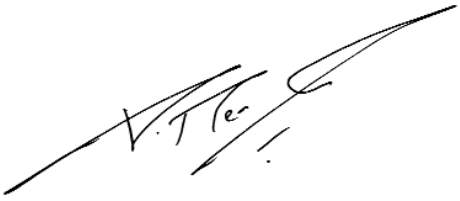
FOREWORD

Technicians are vital to fulfilling the UK's vision for a knowledge-based, innovative, wealth-creating economy. Yet their role, qualifications and skills, are often greatly misunderstood.

We hope that this Briefing Paper will help remove some misconceptions, highlight new opportunities and promote new thinking around the crucial part that Technicians currently play in our science and technology businesses. So that students, educators, employers and policy-makers can better exploit that economic and social potential.

Our recommendations include new models of entry into the profession and we look forward to the expanding debate among all STEM stakeholders as we seek to re-evaluate and better promote the role of Technicians.



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- FE Colleges;
- Business and industry;
- Regional Development Agencies;
- Government Departments and Agencies
- Higher Education Institutions;
- Learning & Skills Councils (national & local);
- Sector Skills Councils;
- National Skills Academies.

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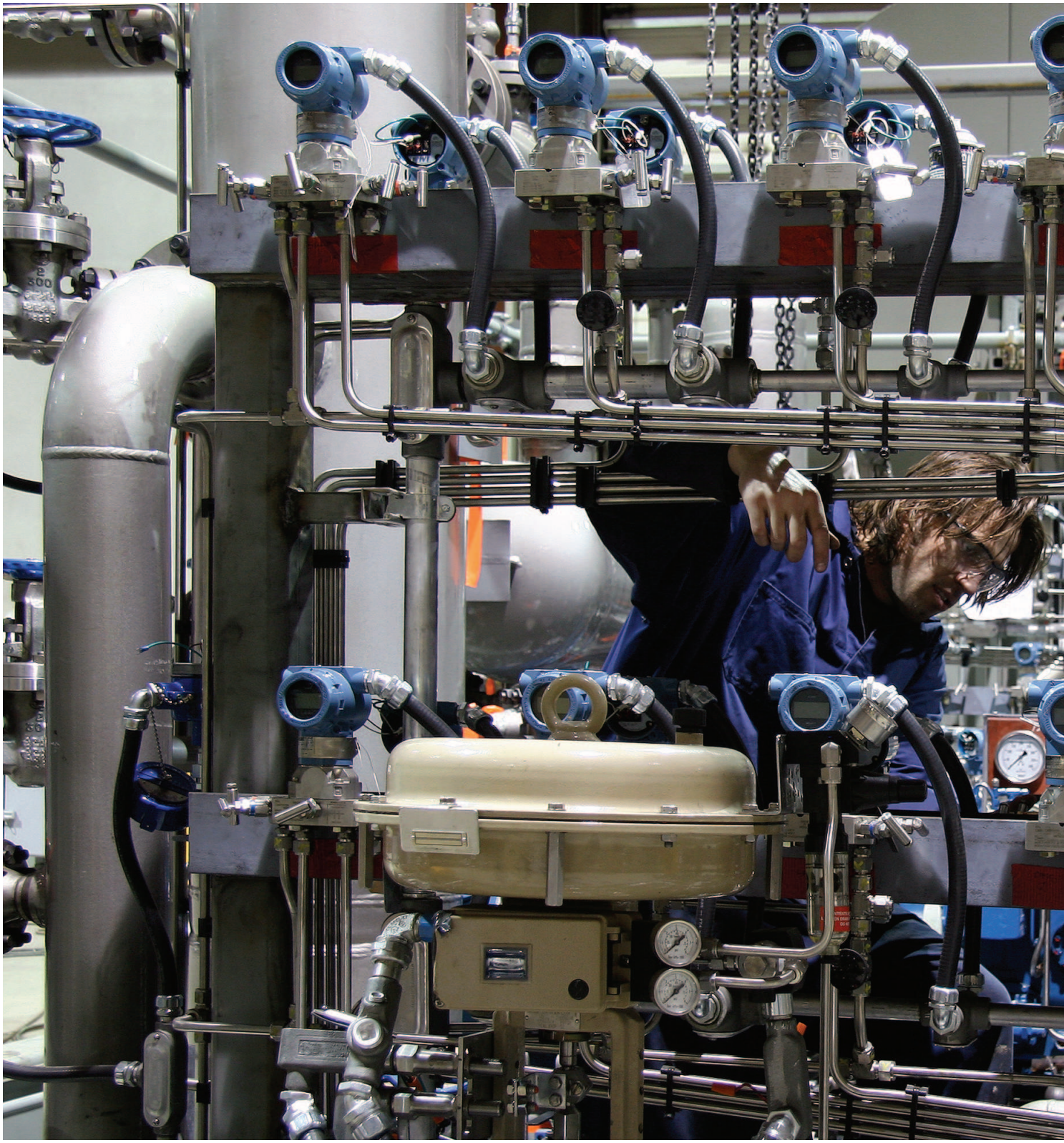
We would like to thank the participating organisations represented in the national and regional think tanks in Annex 2.

Finally, we would also like to thank the New Engineering Foundation Advisory Panel[1] for their continued enthusiasm and effective involvement.

1 The New Engineering Foundation Advisory Panel consists of representatives from the following organisations: London Development Agency; Higher Education Academy Engineering Subject Centre; Learning and Skills Improvement Service; BASF; OFSTED; National Physical Laboratory; Higher Education Academy Physical Science Subject Centre; Procter & Gamble Pharmaceuticals (UK) Ltd; Royal Academy of Engineering; SEMTA; East of England Development Agency; Royal Society; Institute of Directors; Engineering Employers Federation; BBC; North West Regional Development Agency; PriceWaterhouseCoopers; Association of Colleges; National Skills Academy for the Process Industries; Foundation Degree Forward; Bournemouth University; South West of England Regional Development Agency; Cogent Sector Skills Council Ltd; Gatsby Charitable Foundation; Skills for Justice.



KEY HIGHLIGHTS

Purpose

This report is concerned with exploring how a professional registration scheme for science related technicians might be developed to support the national vision for 'science and innovation' – so that science is valued, people feel confident in its use and there is support for a representative, well qualified workforce.

Strategic context

The demand for intermediate to high-skill occupations, especially technicians and associated professionals in science, technology, engineering and maths (STEM) related industrial sectors is expected to grow significantly over the next 10 years and the supply of skilled people will need to be improved.

Clear and credible technical and vocational education pathways related to careers across a broad range of STEM related sectors either do not exist, or are at best, underdeveloped. Technicians do not have a clear professional identity and career development structures are generally weak. The range and diversity of technician roles across industry sectors and the differing industry needs is the major challenge.

The professional technician

Professional registration schemes at technician level exist in a number of sectors and impact positively to:

- Build the credibility of professional recognition and attract talent;
- Provide an overarching professional framework for career development;
- Enable learning and professional development;
- Support strategic planning on skills and provide a means to assess the health of the technician profession in a robust manner;
- Promote the 'value of the technician' role.

The engineering and health sectors have developed professional registration schemes at technician level which in some instances (e.g. pharmacy technician) place registration within a legislative environment.

In addition, there is a vast array of occupational accreditation relating to specific industry needs. Nevertheless employers in a number of sectors see the development of a professional science technician's scheme as adding value. These sectors include: food processing and manufacture, agriculture and high-technology engineering such as defence systems, nuclear, nanotechnology, and bioengineering.

Establishing a registration scheme at technician level to meet the varying needs of employers in very diverse settings is the key challenge. Differentiating qualifications from professional recognition and supporting both qualification and experience based routes is the key. Some common features can be identified founded on:

- *STEM knowledge and skills* including an understanding of the basic 'science' principles as well as more technically specific aspects;
- *Sector specific related knowledge* including a knowledge of the tools, equipment, materials and supplies that are used in the sector;
- *A range of generic skills and behaviours* which often include problem solving and team working and a set of attitudes, traits and behaviours including professionalism, resourcefulness, and orientation to quality and improvement.

The demand for technician level skills is widely reported and the need to support the pipeline of skills widely accepted. Development of a professional registration schemes in gap areas is seen as a key strategy to meet this demand.

Many science technicians do not have their professional skills recognised within a professional registry, and there is significant scope to extend the reach of such schemes in these areas (i.e. food processing and manufacture, agriculture and high-technology engineering such as defence systems, nuclear, nanotechnology, and bioengineering). Employers in these areas seem to support this development. Employer confidence is the critical factor in the development of any such schemes.

Employer views

Broadly employers' views range from:

- We have an existing professional registration scheme at this level;
- Such a scheme would be relevant to us;
- Difficulty in seeing how individual industry needs can be met;
- Concern over the impact on salaries;
- Recognition of the value such schemes bring

to the standards and professionalism of technician work;
- Recognition of the value of a 'professional science technician' status in strategic terms;
- Excitement and willingness to take part in any pilot and involvement in the development of the scheme.

The development of a common scheme across all sectors, bringing existing arrangements into a wider common framework is, however, not deemed to be feasible at this stage.

The proposition

Development of a registration scheme ('SciTech') to serve technicians in sectors where gaps have been identified is proposed. Real benefits can be identified for employers, the individual and society – all of which relate to strengthening the professional status of technicians, improving standards and better promotion of the role.

The new Qualifications & Credit Framework (QCF) has been developed and piloted by *Qualification and Curriculum Development Agency* (QVDA) will support a more flexible approach, but the need for wider stakeholder involvement is recognised.

Two models of entry are suggested:

Model 1

'SciTech' as an industry-based qualification developed by STEM related Sector Skills Councils (e.g. SEMTA, Cogent, EU Skills and Improve) could be offered to employers to recognise their workforce development and training achievements, thereby taking advantage of the QCDA's newly introduced Employer Recognition Programme(ERP). The SciTech qualification could be mapped onto the existing occupational standards that have been developed and are managed by the SSCs to achieve level equivalence and recognition of technician as a career grade. In addition, SciTech as a qualification linked to both Apprenticeship Frameworks and Work Based Learning could provide a progression pathway.

Model 2

'SciTech' as a professional grade (designation) developed either by an existing accrediting professional body such as the Science Council or by a new body. Registrants will then have the opportunity of gaining the SciTech designation and professional institution membership to access continuing professional development programmes through relevant professional institutions. Governance arrangements will need to be explored.

SUMMARY AND RECOMMENDATIONS

The demand for intermediate to high-skill occupations, especially technicians and associated professionals in STEM areas is rising.

A number of gaps exist in the provision of professional registration for science technicians and a new scheme would add value in these areas and would be welcomed by employers. Food processing and manufacture, agriculture and high-technology engineering such as defence systems, nanotechnology, and bioengineering, and other 'emerging technology' areas such as renewable energy and nuclear seem to be the most promising areas.

Accommodating the range and diversity of differing industrial sectors will be the key challenge. If a professional science technician scheme is to be developed, significant work needs to be undertaken.

Seven recommendations have been identified:

Recommendation 1

Validate the evidence base and level of employer support for a 'SciTech' recognition Scheme and determine the areas where added value lies;

Recommendation 2

Establish a 'SciTech' working Group to scope the scheme, establish the mechanism for employer leadership and determine the business case for moving forward;

Recommendation 3

Work with awarding bodies (and with Sector Skills Councils and professional bodies) to

determine the process for registration and continued quality assurance, and establish the stakeholder relationships necessary to support the scheme;

Recommendation 4

Test the approach with employers and technicians in a number of different sectors to make sure it meets their needs;

Recommendation 5

Specify how the registration scheme will improve opportunities for career progression and professional development and provide a means for recognition;

Recommendation 6

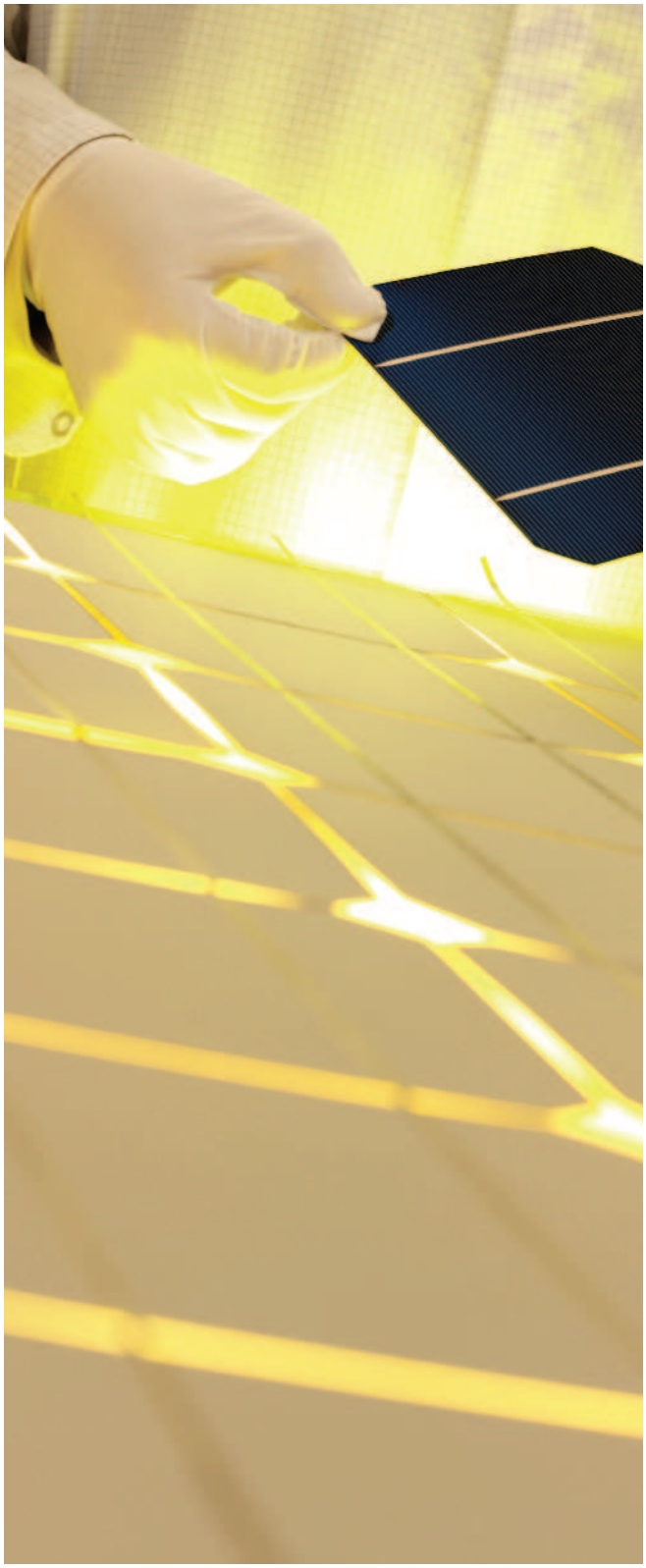
Determine a final proposition for a professional science technician registration scheme and the governance arrangements for its deployment.

In addition, we would recommend the following to address a potentially more fundamental issue relating to the 'vulnerability' in the skills pipeline because of the mismatch between the nature and extent of the existing supply and level of demand from employers and learners alike.

Recommendation 7

Undertake a radical review of the technical and vocational education pathways related to STEM sectors of strategic importance, particularly in new and emerging technologies and establish a new educational framework, informed by international best practice, to improve learner progression and meet the skills needs of, in particular, sectors based on emerging technologies.

1. THE VISION



1.1 Strategic context

The critical role that science, technology, engineering and mathematics (STEM) play in driving the UK economy has been repeatedly emphasised in Government sponsored reviews.

The health of the economy can be seen as a function of productivity and there is an established link between innovation and productivity (Sainsbury[1]), research and productivity (Roberts[2]), and skills and productivity (Leitch[3]). If the UK economy is to remain competitive in the 21st century, scientific and technical skills have a pivotal role to play in supporting innovation, research and improving the skills base of the workforce.

The demand for intermediate to high-skill occupations, especially technicians and associated professionals, is expected to grow significantly over the next 10 years taking into account the growth of new and emerging sectors, growth in the size of the workforce that open up new opportunities and the replacement demand due to retirements.[4]

There is great disparity in the role of technicians across industry sectors. In addition understanding the level and nature of demand and educational and professional

1 www.hm-treasury.gov.uk/sainsbury_index.htm
2 www.hm-treasury.gov.uk/5462.htm
3 www.hm-treasury.gov.uk/leitch_review_index.htm
4 EU Report-Future Skills Needs in Europe Focus on 2020, Cedefop, July 2008

development needs at technician level is difficult. For example, there is no single SOC (Standard Occupational Classification) code that describes and recognises the role of technicians. Different Sector Skills Councils represent different science based industries and there is little consistency across the STEM related sectors in how the role of a technician is defined.

In many vocational areas training for technicians is weak and not demand-led. In addition, the ever changing plethora of vocationally related qualifications makes it difficult for employers to understand what particular Level 3 qualifications signify in terms of the individual's knowledge, skills and aptitudes.

Moreover, clear and credible technical and vocational education pathways related to careers across a broad range of STEM related sectors either do not exist or are at best underdeveloped. Technicians do not have a clear professional identity and as a result there is a paucity of information about technician careers. Employers often recruit university graduates and 'de-skill' them to operate in technician roles leading to a situation where young people do not see that they will gain any financial reward from applied/vocational STEM related qualifications, with the consequent impact that there is a very low take up of courses intended for aspiring technicians, particularly at Level 3 in FE colleges.

1.2 Vision

We want to create the right conditions for 'science and innovation' to flourish – so that science is valued, people feel confident in its use and there is support for a representative well qualified workforce.[5]

A key component of achieving this vision will be to consolidate the technician role in science based industries as a worthy career which is attractive and compelling to many people so that it is widely valued and recognised. This is likely to require a more consistent approach to recognising the professional status of the technician, which will require the key components of initial and continuous professional development and effective codes of conduct to be formalised across all STEM related sectors.

Our aim is to achieve:

- Better strategic planning on workforce development issues in STEM related areas;
- A science technician workforce that is better understood and has clarity and esteem for the roles and responsibilities it fulfils;
- Better mechanisms to drive the take up of Level 3 vocational qualifications and above that are well matched to the needs of employers and technicians;
- Improved progression opportunities for non-graduates.

5 www.dius.goc.uk/consultation/documents/A_vision_for_Science_and_Society.pdf

2. THE PROFESSIONAL SCIENCE TECHNICIAN

2.1 Recognising the term

As key members of the science and technology related workforce, science technicians use their skills in a wide range of industries, from food and health, to nuclear and aerospace.

They couple underpinning knowledge and fundamentals of applied science with both competency and experience, to provide problem-solving and synthesis across many areas that have impact on the quality of our lives.

There is great diversity between technician roles in respective STEM related industry sectors. This diversity is driven by the underpinning science, the nature of the technology in use and the orientation of the role. Annex 1 provides a summary of technician roles and the respective institutes and governing bodies which are associated with them.

The use of the term 'technician' varies greatly across different sectors in terms of recognition, level, competences and status. In some instances the term technician is protected by a formal registration:

EngTech

The Engineering Council UK (ECUK) provides registers that accredit the educational achievement, personal competencies and responsibilities of technicians working in engineering. Currently the 'EngTech' scheme is run through the 36 professional engineering institutions licensed by ECUK and has to date attracted 14,000 registrants. ECUK has also recently launched a similar scheme for ICT technicians.

Pharmacy technician
Registration protects the title of pharmacy technician. Only those on the Society's register will be able to continue to use the title 'pharmacy technician' after it becomes protected in law. However, registration does not protect the role. As such individuals awarded 'pharmacy technician' status can work in different occupations as long as that profession is not regulated.

Biomedical scientist and medical laboratory technician
Entry into the profession is by means of an accredited/approved honours degree in Biomedical Science or equivalent qualification in biomedical science that meets the educational requirements of the Health Professions Council's (HPC) Standards of Proficiency. If a candidate does not have an Institute of Biomedical Science (IBMS) accredited or HPC approved degree in Biomedical Science, a candidate will have to achieve the following:

- A degree that is confirmed suitable for registration by the IBMS;
- A minimum of one year's in-service training in an approved laboratory;
- A Certificate of Competence Registration Portfolio;
- A final assessment – success at this stage leads to the IBMS Certificate of Competence which must be submitted to the HPC with an application for registration.

Once all these stages have been completed, and registration with the HPC has been gained, a candidate can use the title of Biomedical Scientist or Medical Laboratory Technician. To use the title Biomedical Scientist or Medical Laboratory Technician a candidate must be registered with the HPC. In order to gain HPC registration a candidate is required to hold a Certificate of Competence awarded by the IBMS.

In other areas the term is less well understood:

South West Composites Gateway
Materials scientists employed to test and record material chemistry and performance and to some extent process operators. We are in discussions with the National Skills Academy Process Industries to develop a better understanding of these roles in what could become a very large scale automated production.

DSTL
A lack of common terminology leads to a failure by many to identify 'technicians' working within an organisation. For example, DSTL was unable to identify the overall number of science technicians. Available statistics tend to differentiate by grade rather than specialism. However, it was thought that there are about 100 to 200 technicians working in the areas of environmental sciences, biomedical sciences and physical sciences at DSTL.

2.2 Valuing the term

Across industry sectors there is significant variation in the value attributed to the term technician. In pharmacy, for example, The Royal Pharmaceutical Society (RPSGB) hold a mandatory registration scheme for pharmacy technicians and registration protects the title of 'Pharmacy Technician'. Registration is a condition of employment and changes (or alterations) in salary of Pharmacy Technicians may result as a consequence of registration. Only those on the Society's register will be able to continue to use the title 'pharmacy technician' after it becomes protected in law.

Where the 'technicians' role is given formal status within an industry sector real value is attributed to it. Professional registration schemes determine that an employee has the 'right' skills and competencies required for the job role, and enable employers and employees to recognise the status and value of the technician's role.

Inevitably, impact on salary is a cause for concern for some employers whilst for others the term 'technician' is seen to have negative connotations and other terms such as technologist, engineer etc. are used instead.

BASF

For the Registered Science Technician scheme to work there needs to be a well defined career progression and some 'brand value' – often technicians have been seen as poor relations and the job will quite often be done by either young graduates or mature women due to the pay structure – maybe you need to move away from the term technician. Some of the most highly skilled people technically are technicians but they won't have the salary or position to reflect this.

Many technician type roles are accredited and standards are set which apply to the industry sector (welding, gas, electrical, and many more). Many of these standards do not have associated codes of conduct, nor do they require ongoing professional development and can be differentiated from professional registration schemes in this respect.

In other areas (food manufacturing for example) no set standards are applied.

Food manufacturing (Ginsters)

Technicians in this sector include process and food technicians working under a technical manager. Thus specialist knowledge is required in food components and ingredients, food structure and an understanding of the scientific principles of food processing/manufacture. No specific qualification for technician roles at Level 3 or 4 is actively sought when recruiting, thus applicants from vocational pathways, work experience and higher education (graduates) are equally desirable. Recruitment is based on attributes rather than qualifications.

2.3 Generic /sector specific competencies

2.3.1 Competency

The range, scope and level of the competency frameworks associated with technician related occupations vary greatly. For some this is a serious inhibitor to establishing any cross-cutting registration scheme for technicians.

It is clear that the detailed knowledge base in each industry is very specific both to role and sector. That said some general themes can be determined. Competence is founded on:

- STEM knowledge and skills including an understanding of the basic 'science' principles as well as more technically specific aspects;
- Sector specific related knowledge including a knowledge of the tools, equipment, materials and supplies that are used in the sector;
- A range of generic skills which often include problem solving and team working and a set of attitudes, traits and behaviours including professionalism, resourcefulness, and orientation to quality and improvement.

Continuous professional development and compliance to an agreed code of conduct are also common requirements. By illustration the table below presents an outline of the competence and standards for Professional Registered Technicians:

	The Competence and Commitment Standard for Professional Registered Technicians *Science Technicians must be competent throughout their working life, by virtue of their education, training and experience, to:*	**Guidance – these are examples of activities which could demonstrate that you have achieved the criteria** *Tell us about your career and the education and training you have received. Explain how the experience you have gained has made you more competent*
A	Use science knowledge and understanding to apply technical and practical skills *This includes the ability to:*	The reviewers will be looking for evidence that you have the know-how to do the job and were able to go beyond the immediate requirements and use your initiative and experience to solve a problem or improve a process
A1	Review and select appropriate techniques, procedures and methods to undertake tasks	Describe something in your work you were involved in which didn't quite work and explain why
A2	Use appropriate scientific, technical or engineering principles	Drawing from your direct experience, this might be an explanation of how a piece of equipment, system or mechanism works
B	Contribute to the design, development, manufacture, construction, commissioning, operation or maintenance of products, equipment, processes, systems or services *In this context, this includes the ability to:*	Explain how you contribute to one or more of these activities
B1	Identify problems and apply diagnostic methods to identify causes and achievesatisfactory solutions	Show an example of how you have used measurement, monitoring and assessment to identify the source of a problem or to identify an opportunity
B2	Identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety and environmental impact	Illustrate how you make decisions about what material, component, people or plant to use or how to introduce a new method of working
C	Accept and exercise personal responsibility *This may include the ability to:*	Describe an experience or instance where you have had to accept personal responsibility for seeing a process through to completion within agreed targets
C1	Work reliably and effectively without close supervision, to the appropriate codes of practice	Your evidence should show how you personally identified and agreed with what had to be done and to what standards on a typical project
C2	Accept responsibility for work of self and others	Minutes of meetings; site notes and instructions; Variation Orders; programmes of work; specifications, drawing and reports; appraisals. Activity not associated with your job can contribute evidence
C3	Accept, allocate and supervise technical and other tasks.	
D	Use effective communication and interpersonal skills. *This includes the ability to:*	You will need to show you can: contribute to discussions; make a presentation; read and synthesise information; write different types of documents

D1	Use oral, written and electronic methods for the communication in English of technical and other information	Letters, reports, drawings, advice, minutes, including progress meetings, appraisals, work instructions (and other task planning), and organising documents certificated by colleagues, clients, customers or management Your application itself will be relevant
D2	Work effectively with colleagues, clients, suppliers and the public	Examples of how this has occurred, and your role at the time
E	Make a personal commitment to an appropriate code of professional conduct, recognising obligations to society, the profession and the environment *In order to satisfy this commitment, they must:*	Your commitment will be to become part of the profession and uphold the standards to which all members subscribe. You need to show that you have read and understood your Institution Code of Conduct
E1	Comply with the Code of Conduct of their Licensed Institution or Professional Affiliate	You will need to sign a personal undertaking The professional review involves demonstration of, or discussion of, your position on typical ethical challenges
E2	Manage and apply safe systems of work	Evidence of applying current safety requirements, such as examples of good practice you adopt in your work. You will need to show that you have received a formal safety instruction relating to your workplace, such as a CSCS safety test, or an update on statutory regulations such as COSHH requirements
E3	Undertake scientific work in a way that contributes to sustainable development	Examples of methodical assessment of risk in specific projects; actions taken to minimise risk to health, safety, society or the environment
E4	Carry out continuing professional development, including opportunities for this offered by their Institution, to ensure competence in areas and at the level of future intended practice	This means demonstrating that you have actively sought to keep yourself up to date, perhaps by studying new standards or techniques, or made use of magazines, branch meetings and other opportunities to network in order to keep abreast of change

2.3.2 Level

Technicians maybe qualified at (NVQ) Level 2, 3 and 4 or an advanced apprenticeship in a science related subject, and in some instances, as with biomedical technicians, to an appropriate degree level standard.

2.3.3 Employers' perspectives

Employers identify competencies which are common across a number of disciplines:

> *'Many of the competencies are common across all disciplines – team working, initiative, customer focus, etc.'*

BASF

> *'Principal skill requirements for BASF are practical, team focused competencies, communication, knowledge transfer and interpretation skills'*

BASF

> *'There are generic CPD needs across the sector, for example, project management and budget management skills needed to improve career progression for technicians; however, sector specific training should be the domain of the employers.'*

But recognise that determining a generic set of competences for the science technician role across sectors is not feasible nor necessarily desirable:

DSTL

> *'Each individual discipline will have its own competencies in terms of qualifications and experience; there is probably not a specific set of competencies that distinguish a scientist in the broadest sense.'*

Ginsters

A scheme would need to manage the intricacies of individual needs and training. Anything that did not deliver this would be a 'blunt instrument'. A scheme would need to encompass (a) scientific technical skills to perform role, and (b) general interpersonal skills. A combination of both is essential, developing the application of technical skills in the work environment and improving effectiveness of employees.

BASF

Competencies would have to be modular to reflect the diversity of sectors included within 'registered technician'.

Royal Pharmaceutical Society of Great Britain

There are already groups of regulated health professionals whose qualifications for registration are science based and set at level 3 NVQ. For example, from July 1, 2009 the Royal Pharmaceutical Society has statutory powers to regulate pharmacy technicians across Great Britain. The educational standard for entry to the register is NVQ level 3 in Pharmacy Services. In addition the General Dental Council has set the educational standard for entry to the it's register of dental nurses as NVQ level 3 in Dental Nursing.

These qualifications are very different and have been developed to address the specific knowledge and competences required for these groups of staff. In light of the diversity of current level 3 science-based NVQs we are unsure what the advantages would be to the NHS of creating a single registered science technician professional grade for NHS workers with NVQ level 3 science-based qualifications.

2.4 Key market sectors

Some sectors are well served by existing or new technician level professional registration schemes of which health and engineering are examples.

Other sectors are less well served. Here, the emphasis is on employer-led training rather than 'professional standards' although in the initial consultations there has been interest from businesses in these sectors in the development of technical level professional registry. Sectors in this category include food processing and manufacture, agriculture and high-technology engineering such as defence systems, nuclear, nanotechnology, and bioengineering.

> *'BASF see a gap for wider technical/soft skill competency training in their sector. The only professional registration scheme available in the sector is BASIS Registration Ltd. BASIS is an independent organisation set up at the suggestion of the UK Government in 1978 to establish and assess standards in the pesticide industry relating to storage, transport and competence of staff. This scheme only recognises technicians within a small part of the business. The BASIS qualification has taken many years to establish, and is now accepted by employers as a quality standard'.*

2.5 Summary

Where professional registry schemes have been applied, they have proved effective in accrediting educational achievement, raising standards, supporting professional development and raising the profile of the profession. However, the great disparities in a technician's role and function across industry sectors present real changes in moving to a common standard registry system for technicians.

These differences are reflected in wide ranging competency standards and levels of entry which are typically industry specific.

In addition, the existence (or introduction) of legislative standards (e.g. for pharmacy technicians), the development of more cohesive sector related systems like the work being undertaken by the HPC in the health sector, and the genuine scepticism of employers all mean that such a common registration scheme is neither feasible nor attainable.

That said many science technicians do not have their professional skills recognised within a professional registry, and therefore there is significant scope to extend the reach of such schemes in areas where gaps exist providing issues of positioning, standards and entry requirements, protocols, progression routes etc. can be resolved. The benefits of such schemes are clear:

- The credibility of professional recognition should attract more individuals to consider careers as science technicians;
- They provide a means by which to create an overarching professional framework for an individual as their career develops enabling them to continuously progress, adapt and develop their knowledge and competency;
- They provide a means to support learning and professional development, and enable more accurate measurement of skills shortages, thereby creating a means to assess the health of the technician profession in a robust manner;
- Recognition will help to promote the 'value of the science technician' as a member of a professional community with transferable skills that are able to be re-trained with ease, based on an initial well-designed technician learning programme delivered by the FE sector and others.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3. THE DEMAND FOR TECHNICIANS

3.1 Demand for technicians in science-related sectors

Strategic assessments all point towards an increasing demand for technicians in science related sectors.

Nationally the lack of science technicians is a real and growing threat to the expansion of the UK economy. As recently as 2008 the CBI found that a quarter of employers were having difficulty recruiting to Level 3 technician posts. This issue is reflected across many sectors and is illustrated in the example below:

Nano technology

The Skills Training Survey conducted by the Institute of Nanotechnology in 2007 identified the availability of qualified and skilled professional technicians as a major HR issue in 23.5% of organisations also noting skill needs relating to specific expertise (22.4% responses), broad knowledge base (21.9% responses) and continual professional development (19.7% responses). Lack of trained personnel, quality of graduates and attraction for a career in science was also noted as a problem. Dr. Michael Pitkethly, Chief Executive officer of CENAMPS, commented: "In general there is difficulty in recruiting skilled technicians for engineering and high technology companies. The demise of the widespread apprentice schemes and a move to increasing university courses has meant that there is a shortage of good technicians to do hands-on work, for example machinists."

Overall the size of the market, and level of demand for technicians, is difficult to assess, a problem which employers recognise:

'The overall number of science technicians is not readily known because the available statistics tend to differentiate by grade rather than specialism. There are probably about 100 to 200 working in the areas of environmental sciences, biomedical sciences and physical sciences' (DSTL)

The Labour Force Survey would suggest that in the period April to June 2008 there were 235,000 science and engineering technicians. This represents a growth of 5,000 over the preceding four year period. Furthermore, even a modest replacement level of 10% would require an inflow of 23,000 science and engineering technicians at 2008 levels and as Government pursues its intent to invest in STEM related sectors we could anticipate the level of demand will increase.[6] This fact, coupled with the poor flow of skills into science related sector, intensifies the need to invest in and promote better careers at the technician level.

In addition whilst not exhaustive the emerging sectors identified in the *New Industry, New Jobs* White Paper provide an illustration of how policy interventions, concept/technology development, and commercialisation and market development is likely to create new demand for technicians. These sectors are low carbon and renewables; ultra low carbon vehicles; digital sector; life sciences and pharmaceuticals; advanced manufacturing (aerospace, composites, industrial biotechnology, plastic electronics); engineering construction; and, the ageing society. Growth estimates for the offshore renewable energy sector alone suggests the creation of up to 35,000 new jobs many of them at technician level over the next 12 years.[7]

3.2 Evidence of demand for a professional science technician recognition scheme

The potential size of the market for a professional technician recognition scheme is difficult to determine – conservative estimates indicate a potential population of 230,000 with an annual influx of 23,000.

Technicians in some vocational areas are well serviced by both established and new registration schemes. There are also significant gaps which mean that opportunities exist to attract numbers of qualified professionals in areas that have not, hitherto, found a compelling route to professional registration and provide them with opportunities for recognition, continuing professional development and educational progression. This will be particularly relevant in areas of emerging technology and to provide recognition for individuals at entry level for career paths in technical areas of STEM related sectors. Strengthening the progression route for individuals on advanced apprenticeships would be one example.

The key measure of any new register's success will be the degree to which employers value and respect it. For this to happen, employers will need to have confidence in the scheme and see it as a source of technical talent. As employers actively begin to seek registered technicians when recruiting new staff the scheme will secure high status within the workforce. Some early consultation has

6 New Industry, New Jobs – White Paper
7 Employment Opportunities and Challenges in the context of a rapidly growing industry: A closer look at the development of wind, wave & tidal energy in the UK (*Bain and Company, 2008*)

taken place and initial employer feedback (from gap areas) is positive:

DSTL
'Recognition of staff competencies in this way would provide a framework for recruiting and developing staff and should encourage staff to develop competencies and skills to further their careers. An experience based element would be particularly important. If this scheme proceeds, we would encourage take up by staff'

Aerospace
'From my experience in both the Motor Transport and Aviation Engineering sectors, I do think that the creation of a Science Technician Professional Grade could be beneficial.'

DSTL
'The experience based element is particularly important in DSTL where members of staff are working with dangerous materials and systems in hazardous situations.'

Recognising and valuing the role of the science technician would support capacity building by attracting new learners to applied science technician education as well as a means to grow the existing pipeline of learners. Learners that are either currently pursuing a form of vocational qualification or apprenticeship route in science, or those who are interested in pursuing applied science qualifications (S/NVQ Level 3 or equivalent in science) would find such a scheme attractive.

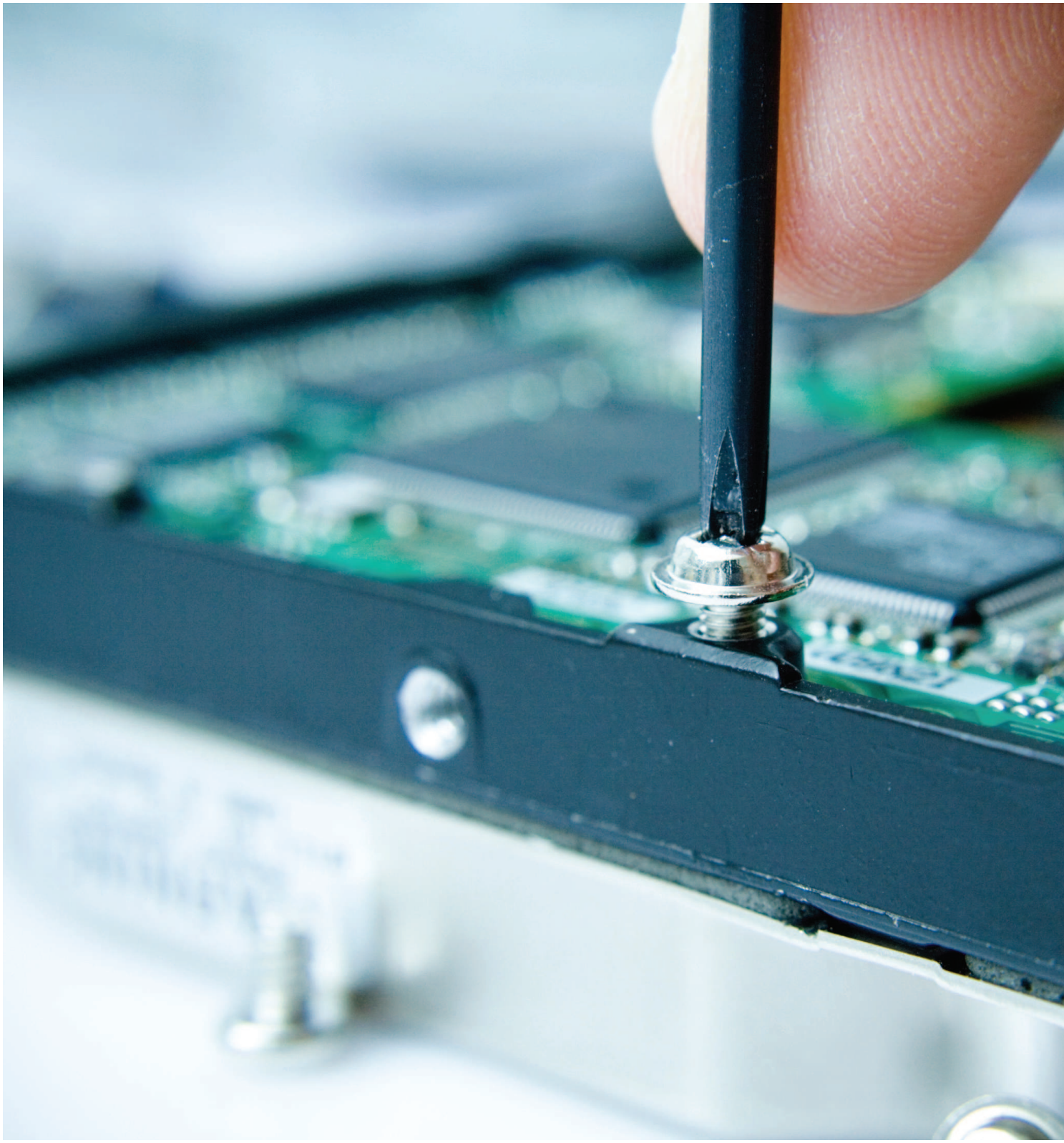
CATCH
A key success factor to adding recognition into 'technician development' is to promote the value of the technician. An individual with transferable skills is able to be re-trained with ease based on the nature of the initial, well-designed 80% technician learning programme done by the FE sector. The programme will be geared to many potential career moves as we adjust to lifelong learning (life-time flexibility) to address movement in the workforce. This will be a corporate necessity in the demand to stay ahead in the world economy. It will be a feather in the cap of any technician gaining the final recognition status.

BASF
Developing a new registered technician scheme may also provide a professional path for those on student placements. Within BASF and many other applied science based organisations, we rely on a great deal on sandwich students. If I look around at a lot of my friends and colleagues I would estimate that at least 70% if not more went through a sandwich placement. We now have some very senior members of our organisation that were students within BASF and have continued their career within in.

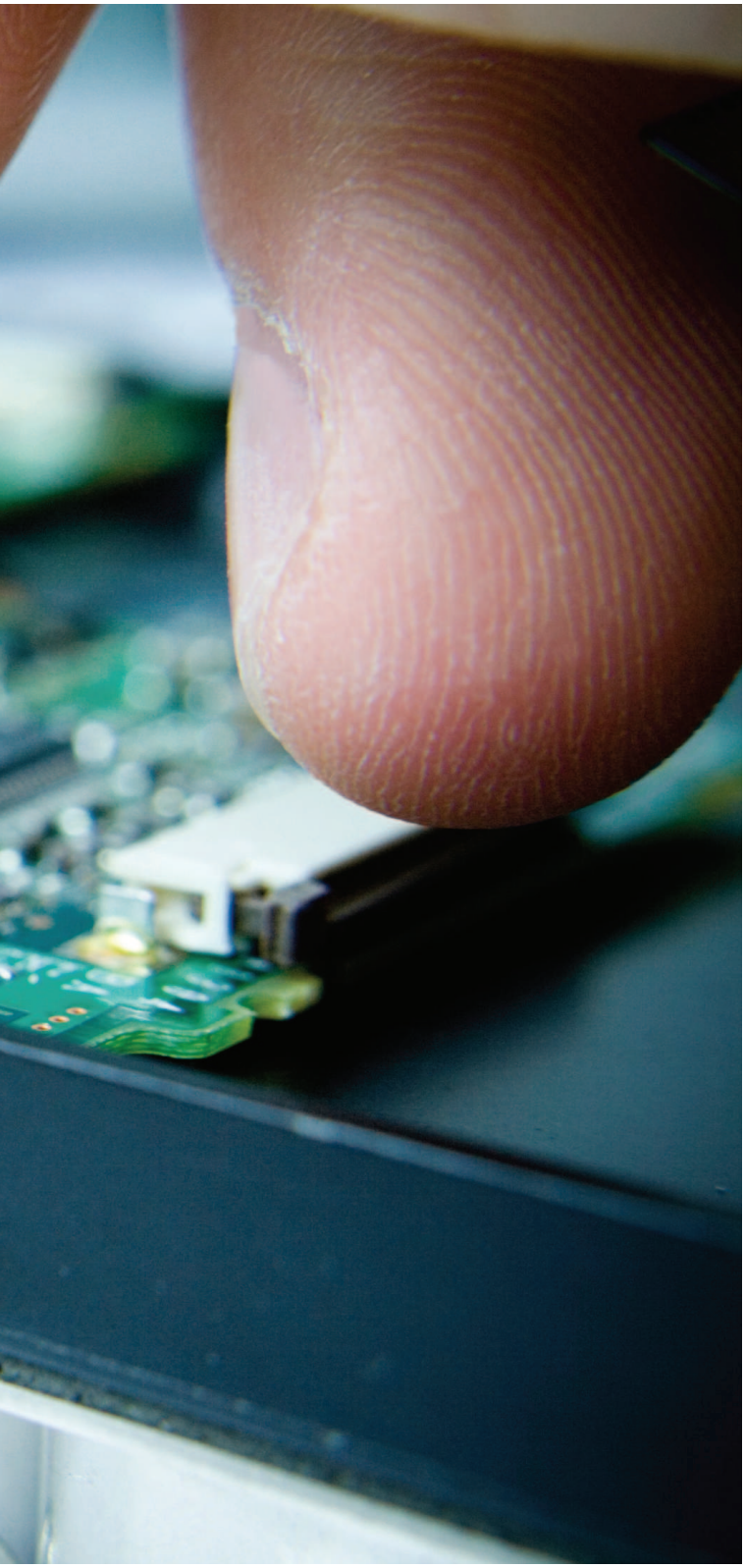
[It would provide] CPD training and status to develop career aspirations, formally recognising the role, responsibility and competencies of 'technicians'

'[placement students] still don't really get any formal recognition which relates to their placements – within BASF now we are not allowed to give references for legal reasons so we do have our hands tied – maybe a chance to offer a Part 1 registered technician qualification as part of the placement – this could help us attract students and give the placement some career value'.

'We have one guy here who has done his A levels but has chosen not to do a degree as he considers that he would rather learn on the job… registered technician may provide a professional route'.



4. THE PROPOSITION



4.1 Adding value

A registration scheme for science technicians would add value in targeted areas. Well developed professional technician registration schemes exist (health, engineering) but employers do see value in the introduction of professional register for science technicians in areas where significant gaps and opportunities can be identified.

A number of challenges will, however, need to be addressed resolving issues relating to:

- Disparity of roles;
- Varying competency requirements of different industry sectors;
- Range of levels and content of qualifications and entry requirements;
- Status governance and promotion of the scheme.

Differentiating between recognition and qualification, and alignment with the new QCDA Qualifications and Credit Framework will help.

CATCH

[A professional registration scheme] would add value in terms of recognition but as an overarching qualification. It will be complicated to gain consensus from the number of different FE/VQ options in the market.

It will need an institute forming as a custodian of the standard in line with CIPD, CMI, ILM or

IMechE to use a few examples. If it were fragmented into the many different existing institutions there would always be arguments over differentials and status. One ISci-Tech (Institute of Science Technicians say) with a government charter setting its own defined routes of entry, CPD requirements and working across many sectors will be one proposed solution.

This would not be a professional qualification but recognition (with letters) of achievement.

Incidentally, the wheel goes around every 20 years or so and this type of technician status existed with some Training Boards in the 1960s, 70s and 80s. I remember the Engineering Industry Training Board's TR21 Technician programme well and its adoption/use by the Plastics Processing Industry Training Board. Graduates of this programme had high technical skills and ability qualifying as draughtsmen, project engineers, planners, estimators, cost engineers including being managers of the same later in their career development.

A flexible technician registration scheme could be developed to cover a range of vocational areas. A common register would ensure that the roles and responsibilities of technicians were clearly identified and widely promoted. It would also provide a common standard for the quality of UK technicians which was led by the profession and not subject to continual change in the way that qualifications are. The scheme could be developed which would:

- Provide professional recognition for science technicians across a number of sectors, particularly related to emerging technologies;
- Adopt the exemplifying educational standard for science technicians at probably Level 3 NVQ or an advanced apprenticeship in a science related subject in line with other comparable professional grades (EngTech) to ensure parity in level and standards;
- Provide recognition to everyone who can demonstrate the required knowledge, understanding and professional competence;
- Require (and thereby demonstrate) commitment to maintain professional development and to work within professional codes of conduct;
- Development of a family of professional grades comprising of Associate, Member and Fellows;
- Drive the take up of Level 3 qualifications better matched to the needs of employers and technicians;
- Provide clarity and esteem for the roles and responsibilities of technicians;
- Improve progression opportunities for non-graduates;
- Promote science technician career pathways.

For ease of discussion we propose 'SciTech' as a working title for the scheme. Such a scheme could have clear benefits for individual technicians, employers and wider society – as follows.

4.2 Potential benefits

A range of potential benefits can be identified – including:

For individual technicians

For individuals 'SciTech' membership would:

- Provide professional recognition with recognised baseline of proven knowledge, understanding and competence. A science technician who satisfied the requirements

of the new register would be entitled to use the designation Registered Technician (Science);
- Demonstrate commitment to professional standards and to developing and enhancing competence through initial and continuing professional development;
- Facilitate access to relevant CPD providers and skills academies as well as professional institutions to ensure the professional needs of technicians for updating and development are met.

For employers

'SciTech' will be an employer-centric professional grade which would:

- Provide employers with the assurance that their science technicians have externally assessed competence and verified credentials as well as a commitment to continuing personal and professional development;
- Ensure that registered technicians are governed by a professional code of conduct and are able to access assistance and support in determining their obligation under this code – this is becoming increasingly important in such sectors as medical technologies, health, aerospace and food processing.

For the economy and society

'SciTech' registration would:

- Recognise and promote the wide range of qualified science technicians under a recognised professional scheme and grade that is externally validated;
- Raise the status of technicians as valued and trusted professionals in society;
- Provide an assurance of safety in practice by maintaining continuous updating of skills and knowledge;
- Support for the drive for improvements in productivity and levels of performance in the UK.

4.3 Issues to be addressed

Issues of diversity will need to be addressed and key stakeholder relationships cultivated. In establishing a common register it will be important to recognise and accommodate the breadth and diversity of specific industry sector requirements.

Competency and CPD requirements will vary and the approach to recognition must embrace both the S/NVQ route and the experience-based route. Applicants would have their competence assessed through a professional review in which applicants are assessed against the competence standards listed in the register through the submission of a range of evidence showing educational qualifications and workplace competences. This could be very straightforward in some cases such as apprenticeships.

In addition a number of important relationships will need to be supported. These include:

- The new QCF recently developed by QCDA should be encouraged to support this approach;
- A registration scheme would also emphasise the value of apprenticeships, providing an effective way of recognising completion of an apprenticeship;
- Links with key higher level professional bodies operating in the fields of science will also need to be established to support progression options;
- Once the standards and competencies have

been agreed upon, further work will be required to ensure appropriate pathways and qualifications are in place for technicians to access appropriate training;
- Aligning a technician register to other professional registers could increase progression from non-traditional routes into science related professions, e.g. comparison of registers would show what additional training and experience was necessary to progress from advanced apprenticeship through technician to a professional designation such as chartered scientist.

It would be worth exploring whether 'SciTech' could be developed to offer both qualification and professional status (similar to the offer of the Association of Accounting Technicians), thereby offering the choice to learners and prospective registrant technicians. Such development could take advantage of the newly developed National Curriculum Framework to build in the appropriate bridges and ladders that will provide learner flexibility and maximum achievement. Technicians could use the 'SciTech' qualification to enter the job market and/or to use it as a prerequisite to enter higher education (e.g. Foundation degrees).

Moreover, there are a wide range of stakeholders that affect the development of a register for science technicians. These include:

- Sector Skills Councils (SEMTA, Cogent, Improve, Skills for Health etc);
- Professional Bodies and Councils (Science Council, Engineering Council, Health Professions Council, Licensed Institutions etc);
- Regulators (Qualifications and Curriculum Development Agency) and Government Departments (BIS, DCSF);
- Sector Specific Qualification Providers such as BASIS recognised in Crop Protection;
- Large employer with company / sector recognised registration schemes (e.g. Vosper Thorneycroft Group, Ginsters Academy);
- European organisations with registration schemes (National Registration Schemes for Medical Physicists);
- EDI, bodies of vocational qualifications (Edexcel, City and Guilds etc);
- National Apprenticeship Service;
- Educational Agencies (e.g. Foundation Degree Forward).

The views of these organisations would need to be taken into account as any development progresses.

4.4 Possible models

Models of membership and associated benefits will need to be explored. Two possible approaches are suggested here and if appropriate would need to be developed further.

Model 1

'SciTech' as an industry-based qualification developed by STEM related Sector Skills Councils (e.g. SEMTA, Cogent, EU Skills, Improve and euSkills) could be offered to employers to recognise their workforce development and training achievements in line with the Sector Qualification Strategy Action Plans published in Jan 2009.

Developed by the STEM based Sector Skills Councils as a vocational qualification, 'SciTech' be would be designed to take advantage of the QCDA's newly introduced Employer Recognition Programme(ERP) that uses the flexible unitisa-

tion offered by the recently introduced QCF to provide an overarching award to a range NVQ Level 3 qualifications. The SciTech qualification could be mapped onto the existing occupational standards that have been developed and are managed by the SSCs to achieve level equivalence and recognition of technician as a career grade thereby enabling:

- *Employers with the opportunity to recognise the achievements of their employee-learners by consolidating their disparate range of Level 3 S/NVQs, training and professional development, and Advanced Apprenticeships under one coherent 'SciTech' award*
- *FE providers to offer a 'holistic qualification' that recognises the achievements of learners that have undergone different routes of study such as:*
  - *Standard qualification-based training (e.g. S/NVQs, BTEC, City & Guilds)*
  - *Work-based awards and experiential learning (e.g. Apprenticeships, NVQs, Train-to-Gain)*
  - *A combination of these routes*
- *Learners to gain an exciting intermediate level practical science-based qualification, which offer progression routes to Level 4 where currently the supply is very limited*
- *Government to have a vehicle for addressing progression issues particularly at Levels 3 and 4 in science based subjects through leveraging the QCF due to be fully introduced in 2010, to offer learners the flexibility of recognising their credits gained experientially and/or through studying on a course.*

Upon meeting the prerequisites for the 'SciTech' qualification, learners would receive a certificate confirming their achievement from a QCDA's ERP accredited centre (employer or FE provider).

It is important to note that Ofqual have designated some SSCs as awarding bodies. SSCs could provide the accreditation process for employers or private training providers wishing to make their organisations accredited centres. The National Skills Academies that are affiliated to the STEM related SSCs (e.g. NSA-Nuclear, NSA-Process Industries, NSA-Manufacturing) could be used to provide a fast-track accreditation thereby accelerating the uptake and maximising the reach of SciTech.

Model 2

Developed by either an existing professional accrediting body such as the Science Council (or a subsidiary of) or created by a new body (for example, a Science Technician Institute) that focuses ostensibly on the professional recognition and continuous development of science technicians, thereby enabling:

- *Practicing technicians that come from a wide range of scientific disciplines the opportunity to have professional status recognition irrespective of whether they have followed competence based or qualification based routes, thus allowing them the mobility and adaptability on entering the job market, operating within a sector, or moving across other science based industrial sub-sectors;*
- *Registered technicians to have their qualification, competency level and knowledge regularly validated, as well as gaining the full benefits from being part of a professional membership;*
- *The Science Technician profession to be articulated to Government through a representative voice;*
- *Providing Government agencies with an effective vehicle to drive policies and provide*

intervention measures to improve engagement of under-represented groups in science, thus progressing towards the national goals of equality and diversity.

Upon meeting the prerequisites for the 'SciTech' designation, members would receive a certificate confirming their full professional membership of the 'SciTech' professional body and the right to use the designated post nominal. To continue to use the post-nominal 'SciTech' technicians will have to demonstrate evidence of CPD validated frequently (e.g. bi-annually) by the Science Council or representative body (i.e. the body that will have the responsibility to maintain the SciTech Register).

4.5 Governance

Appropriate governance models will need to be established to provide both the status and credibility. Two options are suggested:

One institution to offer professional services and maintain the register

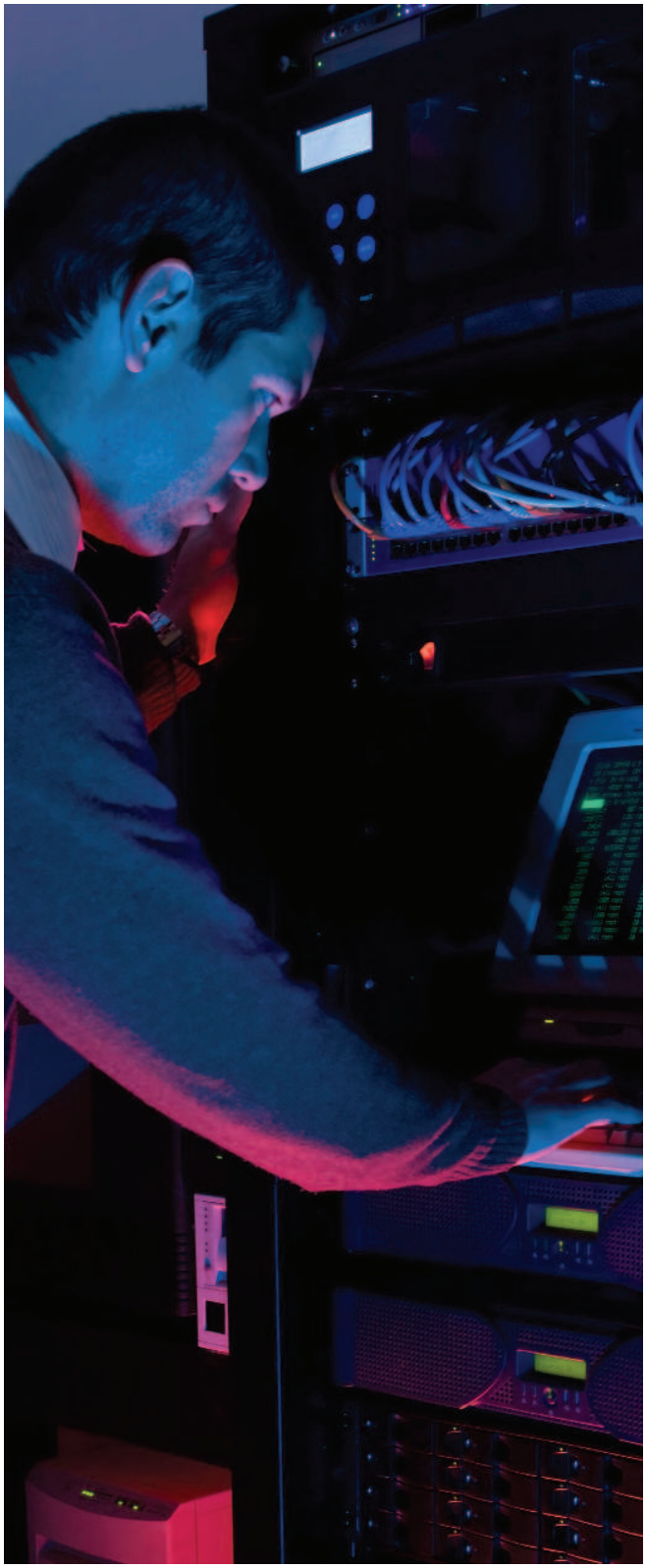
Maintaining the 'SciTech' register of technicians with one organisation will ensure effective communications with the science technician community, as well as ease of data collection and management with respect to the 'SciTech' community. In addition, complying with a baseline quality assurance standard is also easier to achieve as it will be managed by one organisation. However, this model will require significant investment in communications and marketing of the 'SciTech' brand.

Multiple institutions offering professional services but with a single organisation maintaining the register

This model uses different professional institutions to offer professional services and also register 'SciTech' technicians. However, they will be required to reconcile their data with a single organisation that maintains the overall register. This approach will enable communications to wider science technician related communities but will be administratively intensive in terms of data collection and maintenance of registrant information annually. In addition, this model could also offer an opportunity for progression from one professional grade level to another (e.g. SciTech to C.Sci).

Licensing arrangements between the custodian of the SciTech Register and the professional institutions will need to be considered. This will also involve quality assurance processes for approving assessors to meet a baseline standard to overcome any non-linearity in the validation benchmark of the SciTech grade and overcome issues pertaining to data protection.

5. RECOMMENDATIONS AND POSSIBLE NEXT STEPS



5.1 Adding value

The demand for intermediate to high-skill occupations, especially technicians and associated professionals, is expected to grow significantly over the next 10 years taking into account the growth of new and emerging sectors, growth in the size of the workforce that open up new opportunities and the replacement demand due to retirements.[8]

Where they exist professional registration schemes have acted to:

- Build the credibility of professional recognition and attract talent;
- Provide an overarching professional framework for career development;
- Enable learning and professional development;
- Support strategic planning on skills and provide a means to assess the health of the technician profession in a robust manner;
- Promote the 'value of the technician' role.

The accreditation and recognition market place for science related technicians is crowded and confusing. There is a need to better promote the profession and there are opportunities and gaps where this could be done which would create added value for the sectors and individuals

8 EU Report-Future Skills Needs in Europe Focus on 2020, Cedefop, July 2008

concerned. Examples have been identified in food processing and manufacturing industry, agriculture and high-technology engineering such as defence systems, nuclear, nanotechnology, and bioengineering, and other 'emerging technology' areas such as renewable energy.

If a professional science technician scheme is to be developed, significant work needs to be undertaken to position the approach where it can add real value, clarify the most important opportunities, establish the interim governance mechanisms to support development and specify the scheme, map and clarify the positioning with respect to occupational standards, gain employer commitment to the scheme from the onset, establish the pathways of progression and tangible mechanisms for career development, pilot the model and evaluate the outcomes, refine the proposition and agree the governance arrangements for deployment.

Recommendation 1
Validate the evidence base and level of employer support for a 'SciTech' Professional Scheme and determine the areas where added value lies

An initial consultation and research of the 'SciTech' professional scheme has been undertaken by NEF and the findings were positive in areas where gaps in registration exist. This now needs to be validated and the evidence for introducing a professional status for the science technician community tested and consolidated. The process should:

- Work with SSCs to better understand sector needs across all the STEM related subjects with respect to Level 3 *plus* qualifications and the development of better Occupational Standards;
- Review the available evidence and identify where the key gaps and opportunities for developing a 'SciTech' registration scheme lie, identifying potential and future level of demand;
- Identify benchmark schemes from related areas which provide a working solution to the spread and diversity of industry sector needs.

Recommendation 2
Establish a 'SciTech' Working Group to scope the scheme, establish the mechanism for employer leadership and determine the business case for moving forward

A 'SciTech' Working Group should be established to scope, specify and develop the main characteristics of the registration scheme, exploring and developing options for employer leadership and governance, determining the mechanisms for registration and competence recognition, and establishing the cost base on which such a scheme could be delivered – leading to a robust business case for moving forward. It will be important to explore the interplay between technicians and technologists in different sectors and thus make recommendations as to where best such professional descriptors should be located and used.

Innovative approaches for providing access to ongoing professional updating and development will need to be examined to bring relevance and added value to the concept of professional registration.

Recommendation 3
Work with awarding bodies (and with Sector Skills Councils and professional councils) to determine the process for registration and continued quality assurance, and establish the

stakeholder relationships necessary to support the scheme

Work with STEM related SSCs, professional councils and professional institutions to identify and map existing provision, agree the process for registration and the steps for accrediting different grades including: quality assurance procedures; requirements for continuing professional development; identifying the procedures and processes for assessing the competence of applicants (online and off-line) and potential membership processes; defining the criteria for developing the 'SciTech' Register; and validating the approach with key stakeholders. Also raise awareness of, and promote, the concept of the 'Registered Technician' establishing:

- Links to occupational standards;
- Links to professional institutions;
- Links to Apprenticeship Framework;
- Links to the new Qualification and Credit Framework.

Recommendation 4
Test the approach with employers and technicians in a number of different sectors to make sure it meets their needs

Develop and assess models for the 'SciTech' proposition (concept, process and benefits) and test such models on initially a limited number of companies that employ science technicians. For example, the 'SciTech' registration could be tested with highly regulated businesses (nuclear, food processing and aeronautical).

Undertake an initial mapping of the 'SciTech' qualification with employers that are pursuing or have obtained the recently introduced government National Training Quality Standard for Employers (TQSE) to maximise opportunities for reach, impact and future registration.

Work should also be undertaken with employers and the National Apprenticeship Service to pilot the 'SciTech' scheme in a number of industry sectors linked to the Apprenticeship Framework and to evaluate and refine the model to arrive at a final proposition for moving forward.

Recommendation 5
Specify how the registration scheme will improve opportunity for career progression and professional development and provide means for recognition

Examining Level 3 awards and advanced apprenticeships across the key science related sectors, determining how to position these as a career grade for science technicians, and specifying options for re-skilling and up-skilling; working with professional bodies to provide recognised CPD which delivers competency enhancement in a changing technological environment, and is linked to a qualifications system supported by the QCF; and, finally determining opportunities to promote the scheme and recognise achievement, e.g. through Annual Awards recognising technician trainees and employers that support technicians (e.g. scheme in Northern Ireland).

Recommendation 6
Determine a final proposition for a professional science technician registration scheme and the governance arrangements for its deployment

The outcome of adopting these recommendations would be to move quickly to confirm the feasibility of a professional registration system for science technicians, outlining possible

models for development including where best to locate the 'SciTech' qualification and professional designation and its modus-operandi including the business case for moving forward.

Any proposed professional designation scheme would need to be a self sustaining one after three years through funding generated from registration and membership fees.

Alongside the recommendations outlined above in respect to establishing a 'SciTech' professional scheme as part of the strategy to consolidate the technician role in science based industries, a potentially more fundamental issue has been identified through this and other recent work completed by NEF. The issue relates to the 'vulnerability' in the skills pipeline because of the mismatch between the nature and extent of the existing supply and level of demand from employers and learners alike. This situation is likely to worsen as industrial sectors based on emerging technologies (e.g. low carbon and renewables, advanced manufacturing) begin to establish themselves and grow. With this in mind, we would recommend the following.

Recommendation 7
Undertake a radical review of the technical and vocational education pathways related to STEM sectors of strategic importance and establish a new educational framework, informed by international best practice, to improve learner progression and meet the skills needs of, in particular, those sectors based on emerging technologies

In developing a new framework, consideration should also be given to the potential of aligning the sector related pathways to other vocational qualifications (e.g. Foundation Degrees) and professional registration schemes such as the scheme proposed above for science technicians.

ANNEX 1 – Technician roles, respective institutes and governing bodies

Laboratory Technician
The Health Professions Council
Association of the British Pharmaceutical Industry (ABPI)
The Association for Science Education (ASE)
Biochemical Society
The British Institute of Non-Destructive Testing (BINDT)
British Pharmacological Society
The Forensic Science Society
The Genetics Society
The Geological Society
Institute of Biology (IOB)
Institute of Biomedical Science
Institute of Ecology and Environmental Management (IEEM)
Institute of Food Science & Technology (IFST)
Institute of Materials, Minerals and Mining (IOM3)
Institute of Physics (IOP)
Institute of Physics and Engineering in Medicine (IPEM)
The Institute of Science Technology
The Physiological Society
Royal Astronomical Society
Royal Geographical Society
Royal Pharmaceutical Society of Great Britain
Royal Society of Chemistry (RSC)

Animal Technicians
Association of the British Pharmaceutical Industry (ABPI)
Institute of Animal Technology (IAT)

Education laboratory technician
Association of Science Engineers - Technician Membership Plan
http://www.ase.org.uk/htm/membership/baam.php

Pharmacy Technician
Association of the British Pharmaceutical Industry (ABPI)
The Association of Pharmacy Technicians UK
National Pharmacy Association
Royal Pharmaceutical Society of Great Britain

Gas Service Technician
British Gas Service Recruitment Centre
CORGI (The Council for Registered Gas Installers)
Gas Safe Register
Institution of Gas Engineers and Managers (IGEM)

Oil and Gas Industry Technician
Energy Institute
Engineering Construction Industry Training Board (ECITB)
Engineering Council UK (ECUK)
The Engineering and Technology Board (etb)
The Institute of Marine Engineering
The Institute of Materials
Oil & Gas UK

Dental Technician
British Dental Association
The British Institute of Dental and Surgical Technologists
The Clinical Dental Technicians Association
Dental Laboratories Association (DLA)
The Dental Technologists Association (DTA)
The General Dental Council
Institute of Maxillofacial Prosthetists and Technologists
The Orthodontic Technicians Association

Motor Vehicle Technician/Mechanic
Institution of Mechanical Engineers (IMechE)
The Institute of the Motor Industry (IMI)

Aerospace Engineering Technician
The Engineering and Technology Board (etb)
Engineering Council UK (ECUK)
Institute of Engineering Technology (IET)
Institution of Mechanical Engineers (IMechE)
Royal Aeronautical Society (RAeS)

Office Equipment Service Technician
The Institution of Engineering and Technology (IET)

Orthopedic Technician
The Association of Orthopaedic Technicians (AOT)
British Orthopaedic Association (BOA)
Royal College of Nursing (RCN)

Marine Engineering Technician
British Marine Federation
Engineering Council UK (ECUK)
The Institute of Marine Engineering, Science and Technology (IMarEST)
The Institution of Engineering and Technology (IET)
The Marine Society & Sea Cadets
The Merchant Navy Association

Textile Technician
British Textile Technology Group (BTTG)
Confederation of British Wool Textiles Limited
East Midlands Textile Association Ltd (EMTEX)
Engineering Council UK (ECUK)
The Textile Institute

Domestic Appliances Service Technician
Domestic Appliance Service Association (DASA)
Institute of Domestic Heating and Environmental Engineers

Sound Technician
The Association of Motion Picture Sound (AMPS)
Association of Professional Recording Services (APRS)

BECTU (The Broadcasting, Cinematography and Theatre Union)
The Institute of Broadcast Sound

Measurement and Control Technician
Engineering Council UK (ECUK)
Engineering and Technology Board careers information
The Institute of Measurement and Control
The Institution of Engineering and Technology (IET)
Institution of Mechanical Engineers (IMechE)
The Manufacturing Institute

Engineering Construction Technician
Engineering Construction Industry Training Board (ECITB)
Engineering Council UK (ECUK)
The Institution of Engineering and Technology (IET)

Civil Engineering Technician
Engineering and Technology Board (ETB)/Enginuity
Institution of Civil Engineers

Land-based Service Technician
The Agricultural Engineers' Association
British Agricultural and Garden Machinery Association (BAGMA)
The Engineering and Technology Board (etb)
Engineering and Technology Board (ETB)/Scenta
Institution of Agricultural Engineers
Society for the Environment (SocEnv)

Signalling Technician
Association of Train Operating Companies (ATOC)
GoSkills
Institute of Railway Signal Engineers (IRSE)

Chemical Engineering Technician
Chemical Industries Association
Energy Institute
Engineering Council UK (ECUK)
The Engineering and Technology Board (etb)
Institution of Chemical Engineers

Electrical Engineering Technician
Engineering Construction Industry Training Board (ECITB)
Engineering Council UK (ECUK)
Engineering Technology Board (etb)
The Institution of Engineering and Technology (IET)

Windscreen Technician
Glass Training Limited (GTL)
The Institute of the Motor Industry (IMI)

Materials Technician
Engineering Council UK (ECUK)
Engineering and Technology Board (ETB)/Scenta
Institute of Materials, Minerals and Mining

NDT Technician/Specialist
The British Institute of Non-Destructive Testing (BINDT)
The Institution of Engineering and Technology (IET)
Institute of Materials, Minerals and Mining (IOM3)

Photographic Technician
British Association of Picture Libraries and Agencies (BAPLA)
British Institute of Professional Photography (BIPP)
Professional Photographic Laboratories Association (part of the Photo Marketing Association International (PMA UK Ltd))

Polymer Technician
British Plastics Federation
The British Rubber and Polyurethane Products Association
Composites UK
Institute of Materials, Minerals and Mining
The Polymer Innovation Network

Engineering Maintenance Technician
Engineering Council UK (ECUK)
The Institution of Engineering and Technology (IET)

Textile Dyeing Technician
East Midlands Textile Association Ltd (EMTEX)
Society of Dyers and Colourists (SDC)
The Textile Institute

Building Technician
The Association of Building Engineers
Chartered Institute of Building (CIOB)
The Institution of Engineering and Technology (IET)

Geological Technician
British Geological Survey
Energy Institute
The Geological Society
Oil & Gas UK

Audio-visual Technician
Broadcasting Entertainment Cinematograph and Theatre Union (BECTU)
Focal International (Federation of Commercial Audiovisual Libraries)
InfoComm International
Production Services Association (PSA)
Professional Lighting and Sound Association (PLASA)

Telecommunications Technician
Engineering Council UK (ECUK)
The Institute of Telecoms Professionals (ITP)
The Institution of Engineering and Technology (IET)

Electronic Engineering Technician
Engineering Technology Board (etb)

The Institution of Engineering and Technology (IET)
SCENTA (Science, Engineering and Technology Association)

Sterile Services Technician
Central Sterilising Club (CSC)
Institute of Decontamination Sciences (IDSc)
Institute of Leadership and Management (ILM)

Surveying Technician
The Association of Building Engineers
Chartered Institute of Architectural Technologists (CIAT)
Chartered Institute of Building (CIOB)
Chartered Institute of Housing (CIH)
Chartered Surveyors Training Trust
Institute of Revenues
Institution of Civil Engineering Surveyors
Royal Institution of Chartered Surveyors (RICS)
The Royal Town Planning Institute

Special Effects Technician
The Association of British Theatre Technicians (ABTT)
British Film Institute (BFI)
Broadcasting Entertainment Cinematograph and Theatre Union (BECTU)
Institute of Explosive Engineers (IExpE)
Joint Industry Grading Scheme (JIGS)
Producers Alliance for Cinema and Television (PACT)
UK Screen & Regional Agencies

Computer Service Technician
The British Computer Society (BCS)
Computer Technology Industry Association (CompTIA)
Institution of Engineering and Technology (IET)
National Computing Centre

TV and Radio Reception Systems Technician
Confederation of Aerial Industries (CAI)

Mechanical Engineering Technician
Engineering Construction Industry Training Board (ECITB)
The Institute of Marine Engineering, Science and Technology (IMarEST)
The Institution of Engineering and Technology (IET)
Institution of Mechanical Engineers (IMechE)

Architectural Technician/ Technologist
Chartered Institute of Architectural Technologists (CIAT)

Optical Technician
The Association of Contact Lens Manufacturers Ltd (ACLM)
Federation of Manufacturing Opticians
The Worshipful Company of Spectacle Makers

Cavity Wall Insulation Technician
British Board of Agrement (BBA)
Chartered Institute of Building (CIOB)
National Insulation Association Limited

Brewery Worker/Technician
British Beer & Pub Association
Improve Ltd
The Institute of Brewing and Distilling
Society of Independent Brewers (SIBA)

Food Scientist/Technologist
Food and Drink Federation
Institute of Food Science & Technology (IFST)

Packaging Technologist
Engineering Council UK (ECUK)
Packaging Industry Awarding Body Company (PIABC)
The Packaging Society (IOP)
The Paper Industry Technical Association

Textile Technologist
East Midlands Textile Association Ltd (EMTEX)
Society of Dyers and Colourists (SDC)
The Textile Institute

Leather Technologist
BLC Leather Technology Centre Limited
The British School of Leather Technology
Society of Dyers and Colourists (SDC)
Society of Leather Technologists and Chemists

Polymer Technologist
British Plastics Federation
The British Rubber and Polyurethane Products Association
Composites UK
Institute of Materials, Minerals and Mining

Timber Technologist
Forestry & Timber Association (FTA)
The Institute of Wood Science (IWSc)
Timber Trade Federation (TTF)

Anatomical Pathology Technologist
Association of Anatomical Pathology Technologists (UK)
Royal Society for Public Health (RSPH)
Voluntary Registration Council (VRC)

Critical Care Scientist
The Intensive Care Society
The Society of Critical Care Technologists (SCCT)

Materials Engineer/Scientist
Engineering Council UK (ECUK)
Institution of Engineering and Technology (IET)
Institute of Materials, Minerals and Mining (IOM3)

Materials Scientist
Engineering Council UK (ECUK)
Institute of Engineering Technology (IET)
Institute of Materials, Minerals and Mining (IOM3)

Plastics Process Operative
British Plastics Federation
The Institute of Materials

Broadcast Engineer
BKSTS (The Moving Image Society)
Engineering Technology Board (etb)
The Institution of Engineering and Technology (IET)
The Institute of Broadcast Sound
The Radio Academy

CAD Draughts person
Chartered Institute of Architectural Technologists (CIAT)
Engineering and Technology Board (ETB)/Scenta
Institution of Engineering Designers (IED)

Welder
The Welding Institute (TWI) Limited

Food Processing Operative
Food and Drink Federation
National Skills Academy for Food and Drink Manufacturing

Consumer Scientist
Institute of Food Research
Institute of Food Science and Technology
Trading Standards Institute

Meat Process Worker
British Meat Processors Association
Meat Hygiene Service (MHS)
Meat Training Council (MTC)
Royal Society for Public Health (RIPH)
The Worshipful Company of Butchers

Microbiologist
Association of the British Pharmaceutical Industry (abpi-careers)
Institute of Biomedical Science
Institute of Food Science & Technology (IFST)
The Royal College of Pathologists
The Royal Society
Society for General Microbiology (SGM)

ANNEX 2 – Stakeholder consultation

In preparing this paper, NEF and Gatsby representatives have undertaken an initial consultation through discussions, visits, events and correspondence with the following stakeholders:

Organisation	Sector
Amicus	Trade Association
Aseptika	Medical Technologies
BAE	Systems Manufacturing
Barnfield College, Director of NSA Dental Technicians	Professional Body
BASF	Chemical Manufacturing
CATCH Humberside Engineering Training Association	Trade Association
Cogent	Sector Skills Council
Deeside College	FE College
Duchy College	FE College
EC(UK)	Professional Council
Flybe	Aerospace
Foundation Degree Forward	Educational Agency
Ginsters	Food Processing
Health Professions Council	Regulator
Higher Education Academy - Science Subject Centre	Educational Agency
IET	Professional Society
Imperial College	University
Magnox (South)	Nuclear
MISWA Chemicals	Chemical Manufacturing
Representing MoD, QinetiQ and DSTL	Scientific Research Organisations
National Apprenticeship Service	Educational Agency
National Skills Academy Manufacturing	Sector based Educational Agency
National Skills Academy Nuclear	Sector based Educational Agency
Nottingham BioCity	Bio Sciences
Newcastle College	College
NHS	Health
PAA\VQ-SET	Awarding Body
PERA	Scientific Consultancy
Royal Pharmaceutical Society GB	Pharmaceutical Regulator
Royal Society for Public Health/ Institution for Public Health	Professional Body
Science Council	Professional Council
SEMTA	Sector Skills Council
South West Aerospace Composites Gateway	Industry Forum
The Association of Accounting Technicians	Professional Body
TUC	Trade Union
UKCES	Regulator
Unilever	Manufacturing
Unison	Trade Union
Urenco	Nuclear

Events

Medical Innovation Form – the Role of Technicians in the Health Care (10 June)

Emerging Technology Regional Focus Group – Bristol (8 May)

Horizon Scanning in Further Education (8 June)

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