SET Based Technicians

Lessons from the UK and European Labour Force Surveys

Nick Jagger, Maria Sigala, Freddie Sumption

REPORT 475

ies

Institute for Employment Studies

IES is an independent, apolitical, international centre of research and consultancy in HR issues. It works closely with employers in all sectors, government departments, agencies, professional bodies and associations. IES is a focus of knowledge and practical experience in employment and training policy, the operation of labour markets, and HR planning and development. IES is a not-for-profit organisation.

Acknowledgements

We would like to thank Daniel Sanford-Smith, of the Gatsby Foundation, who not only commissioned this work, but who has by helpful questions and suggestions guided the research and reporting in the direction it is now facing. We would also like to thank Tom Levesley and James Walker-Hebborn who have supported in many ways the project from within IES.

Institute for Employment Studies
Sovereign House
Church Street
Brighton BN1 1UJ
UK

Telephone: +44 (0)1273 763400
Email: askies@employment-studies.co.uk
Website: www.employment-studies.co.uk

ISBN: 978 1 85184 430 2

Contents

Executive Summary

This report examines critical features of Science, Engineering and Technology (SET) based technicians working in the UK and compares these to technicians working in other countries across the European Economic Areas (EEA).

The main messages of the report are as follows:

- The main labour market data source, the Labour Force Survey (LFS), does not collect information on the subject of an individual's highest qualification. This means that SET technicians need to be identified on the basis of occupations.
- Within the UK, where we have a more detailed occupational classification available, it is possible to identify two groups of SET technicians:
  - Level 4 SET based technicians – with on average higher level qualifications.
  - Level 3 SET based technicians – with on average lower level qualifications.
- Both the Level 4 and Level 3 technicians had significant numbers of people who only had a Level 2 or below qualification. This suggests there is scope for upskilling the workforce through further qualifications.
- Using a different international classification, a broadly similar group of SET technicians were identified across Europe. Comparison with this group showed that the UK SET technicians were a smaller proportion of the workforce overall and were more likely to have university-level qualification.
- The UK SET technicians were more likely than their European counterparts to have received training, but less likely to be linked to specific sectors.

1 Introduction

1.1 Objectives

The aim of this study is to explore the supply of, and demand for, technician level Science, Engineering and Technology (SET) underpinning skills within the UK. This report is based on the analysis of the UK Labour Force Survey (LFS) and the linked European Labour Force Survey (ELFS) both of which provide a range of detailed labour market information. In particular, the surveys provide details of occupations and levels of qualification that are used to identify SET technicians.

1.2 UK Labour Force Survey

The UK LFS is a continuous, household based, sample survey which reports quarterly. The range of questions asked is designed to inform labour market policy and those used are consistent with the questions used by similar surveys across the European Union. The quarterly data is available for further analysis from the Office of National Statistics (ONS) and the proceeding analyses are based on this publicly available data. As the quarterly data is based on a sample of households the weighted results are subject to sampling error. This means that in practice data cells of less than 10,000 people from quarterly data are considered unreliable and are therefore suppressed in any published reports.

It is possible to merge quarters together and if four quarters are merged to produce an annual view it is possible to publish cells of 6,000 and above. In order to examine details of specific SET technician occupations, we have found it necessary to merge 12 quarters, or three years of data, which allows cells of 3,000 and above to be published.

1.2.1 Defining technicians

Within the UK two approaches to examining SET technician level skills were adopted. Both approaches used a selection of SET technician occupations. This had

the benefit of producing a disaggregated view. However, a consequence of the disaggregated view is that this lowers the level of detail that is available from the analysis. Two groups of SET technicians were identified:

- One group linked predominantly with National Qualifications Framework (NQF) Levels 4 and 5 and linked to the outcomes of Advanced Modern Apprenticeships and, hence, called Level 4 SET based technicians.
- The second group linked predominantly with NQF Levels 2 and 3 and, hence, linked to the outcomes of Foundation Modern Apprenticeships and, therefore, called Level 3 SET based technicians.

1.2.2 Why and how SET

SET skills are generally defined by the possession of a higher level (first degree or above) qualification within these areas. We have deliberately used SET, rather than more recently used Science, Technology, Engineering and Mathematics (STEM) term, as, despite many occupations requiring numeracy, there are no occupations at the technician level based solely on mathematics. A further reason for using SET rather than STEM is that the area of interest excludes accountancy technicians which require numeracy, but do not require scientific or technical underpinning knowledge.

The preference for SET over STEM is compounded by the need to use existing standard classifications to allow linkage to a range of official data sources. This, in practice, means defining SET either in terms of the subject of an individual's highest qualification, or in terms of their occupation, which in turn is based upon their job title. However, with technicians, who usually are qualified at below degree level, a problem with using subject of qualification exists. This is because the main data source used, the LFS, only codes the subject of the highest qualification for foundation degrees and above. This means that using the LFS we cannot identify SET technicians on the basis of the subject and level of their highest qualification.

Therefore, the current exercise focused on defining SET technicians in terms of occupations as coded using the 2000 version of the Standard Occupational Classification or SOC 2000. A similar approach is also used when defining SET technicians using the European LFS where occupations are coded using the International Standard Classification of Occupations (ISCO).

1.2.3 Selection by level of qualification

Using the latest available quarter of the LFS (July to September 2009), all four digit occupations were analysed by level of qualification. Particular focus was applied

to occupations that had over 10,000 weighted workers in the occupation as this is the limit to reliability using a quarter of the LFS. Then all the occupations with 30 or over per cent at NQF Levels 2 or 3 were extracted. This approach identified those occupations traditionally occupied by those with technician level qualifications. A listing of all these occupations is contained in Appendix 1 of this report.

1.2.4 Further selection by occupation

We then sought four digit SOC 2000 occupations within the following SOC major groups:

- Major Group 3: Associate professional and technical occupation.
- Major Group 5: Skilled trades occupations.

These were selected as these occupational major groups were considered to correspond to the concept of technician.

Finally, as well as meeting these criteria, the occupations had to have a significant proportion of SET underpinning knowledge. This was established by checking the occupational description given to each four digit SOC code (ONS, 2001).

1.2.5 Differentiation by dominant level of qualification

The above selection methods produced a selection of 23 four digit SOC 2000 occupations. These were then further examined by the highest level of qualification and were found to fall into two groups. Those that meet the above criteria and still had a substantial proportion qualified at first degree and above or at NQF 4 and above, we considered to be Level 4 SET based technicians.

The second group of four digit SOC codes had a far greater linkage to qualifications in the range of NQF Levels 2 and 3. In this case, all of these occupations had at least half qualified to this level. Therefore, this group of SET technician occupations has been called Level 3 SET technicians.

The Department of Business, Innovation and Skills (BIS) has produced a method to map the highest qualifications recorded within the LFS onto the NQF (BIS, 2009). Using this, we have taken the NQF Levels 4, 5 and 6, excluding teaching qualifications.

1.2.6 Level 4 SET based technicians

This approach produced the following occupations as Level 4 SET based technicians. These had more than 20 per cent at NQF 6 and above as well as more

than 30 per cent at NQF Levels 2 and 3. However, the most common qualification level is NQF Level 4, hence the name. Details of the constituent occupations are provided in Appendix 1.

Table 1.1: Level 4 SET based technician occupations

SOC 2000 Code	Description
3111	Laboratory technicians
3113	Engineering technicians
3114	Building and civil engineering technicians
3115	Quality assurance technicians
3119	Science and engineering technicians n.e.c.
3131	IT operations technicians
3132	IT user support technicians
3218	Medical and dental technicians
5245	Computer engineer, installation and maintenance

Source: IES

In practice, many of those in these occupations were found to hold first degree and above level qualifications; however, the underlying assumption of the SOC classification is that Associate professional and technical as well as Skilled trades occupations are sub degree level qualifications. This in part reflects the great expansion of higher education, but also in part suggests that many people are over qualified for the job they do.

1.2.7 Level 3 SET based technicians

The approach outlined above also generated the concept of Level 3 SET based technicians modelled on the Foundation Modern Apprenticeships. These four digit SOC codes had a far smaller proportion qualified at NQF Level 4 and above. They also had at least half of those in these occupations qualified at NQF level 2 and 3. Details are provided in Table 1.2.

Table 1.2: Level 3 SET based technician occupations

SOC 2000 Codes	Description
3112	Electrical/electronics technicians
3113	Engineering technicians
3217	Pharmaceutical dispensers
5224	Precision instrument makers and repairers
5242	Telecommunications engineers
5243	Lines repairers and cable jointers
5213	Sheet metal workers
5215	Welding trades
5216	Pipe fitters
5221	Metal machine setter and setter operator
5222	Tool-makers, tool-fitters and markers-out
5241	Electricians and electrical fitters
5249	Electrical and electronic engineer n.e.c.
5314	Plumbing, heating and ventilating engineers

Source: IES

1.3 European LFS

In addition to analysing the UK LFS and Eurostat data extractions, we obtained special permission from Eurostat to analyse the ELFS microdata which contains information from 26[1] of the European Union countries plus Iceland and Norway. Additionally in this chapter, we have used some commissioned extractions from the ELFS which also contain data from Switzerland, Macedonia and Turkey.

Eurostat ensure that the series of national LFS across Europe use compatible definitions and questions and are capable of generating data using consistent international standard classifications. These national surveys are then collated to produce a harmonised data set known as the ELFS.

We have obtained extracts from the annual datasets which are constructed using quarterly datasets from the national statistical bodies who undertake their national surveys. In particular, the bulk of the data reported here comes from the 2008 annual dataset. Eurostat uses a variant of the ISCO, known as ISCO 88 COM.

[1] Malta is not included as its small population and sample mean that confidentiality could be compromised by release of the microdata.

Table 1.3 provides a listing of the main SET based technician occupations within ISCO. The physical science and engineering science technicians are clearly within the remit. However, the others are also consistent with the definitions used with the UK SOC 2000 classification shown in Table 1.1 and Table 1.2.

Table 1.3: ISCO-88 codes for SET based technician occupations

ISCO-88 codes	Description
311	Physical and engineering science technicians
312	Computer associate technicians
313	Optical and electronic equipment operators
314	Ship and aircraft controllers and technicians
315	Safety and quality inspectors
321	Life science technicians and related associate professionals
322	Health associate professions (except nursing)

Source: Eurostat ISCO 88 (COM) Documentation

These are broadly similar to the UK SOC occupations included earlier. However, as the available ISCO data only uses three digits of coding, the ISCO SET technicians are less finely described and have fewer sub-categories.

1.4 Structure of report

The rest of the report consists of five additional chapters:

- Chapter 2 – Level 4 SET Based Technicians.
- Chapter 3 – Level 3 SET Based Technicians.
- Chapter 4 – European SET Based Technicians.
- Chapter 5 – National Analyses.
- Chapter 6 – Summary and Implications for the UK.

2 Level 4 SET Based Technicians

This chapter uses the UK LFS to examine technicians who have a SET underpinning knowledge and whose occupations generally require an NQF Level 4 and above qualification. Section 1.2.6 provides details of the detailed occupations included in this category. The process used to identify this group of occupations is also described in Section 1.2. However, in summary, this involved the examination of detailed occupational titles and associated job titles in SOC Major Groups 3 and 5. The dominant highest educational level for each occupation was then used to divide these SET based technician occupations into those centred around NQF Level 3 and NQF Level 4. This chapter examines the SET technician occupations predominantly at NQF Level 4.

2.1 Numbers

In order to obtain the maximum level of analysis, 12 quarters, or three years, of the LFS were aggregated to produce a larger sample. This procedure allows sub groups of 3,000 to be reliably reported rather than the 10,000 limit imposed when using a single quarter (ONS, 2003). This means that sometimes, for instance, the numbers of females cannot be reported while the numbers and proportion of males can be reported. The convention allows the numbers of males to be reported in this case but the precise proportions of males are subject to error if the numbers of females are not reported. Where the numbers are too small to report, they have been replaced in the tables by the symbol '* *'.

This means that we created a 12-quarter sample covering 2007 to 2009, and in order to allow analysis over a five year time frame a further 12-quarter sample was also created covering the years 2001 to 2003. As well as producing a five year time frame, this is the longest available period available where SOC 2000 was used to code for occupations. Slight adjustments had to be made to the samples to account for changes in the way the highest level of qualification were coded over the period. Apart from this change, the other critical variables remained stable

over the period. This is partly because the critical variables were also used by Eurostat as part of the European LFS, and as the Eurostat definitions remained constant so did the corresponding definitions within the UK LFS.

Table 2.1 provides the numbers within each Level 4 SET based technician occupation in 2001 to 2003 and 2007 to 2009 as well as the percentage change between the two periods.

The largest four digit SOC occupation amongst the Level 4 SET based technicians was IT operations technicians. However, medical and dental technicians showed the greatest growth in numbers with 3.3 per cent growth in between the two periods. Importantly, many of the occupations had shown a decline in numbers with IT user support technicians showing a 13.3 per cent decline. The growth in medical and dental technicians presumably reflected a growth in the NHS over the period. While the decline in IT user support technicians probably reflects patterns of technical change impacting patterns of service delivery.

Table 2.1: Numbers of Level 4 SET based technicians

	2001 to 2003	2007 to 2009	% Change
Laboratory technicians	69,733	64,162	-8.0
Building and civil engineering technicians	25,075	25,612	2.1
Quality assurance technicians	19,582	18,767	-4.2
Science and engineering technicians n.e.c.	43,301	41,595	-3.9
IT operations technicians	120,159	121,764	1.3
IT user support technicians	68,060	59,021	-13.3
Medical and dental technicians	32,673	33,754	3.3
Computer engineers, installation and maintenance	43,081	41,613	-3.4

Source: IES analysis of the 2001 to 2003 and 2007 to 2009 LFS

2.2 Levels of qualification

Reflecting the selection criteria for the Level 4 SET based technicians, all of the four digit SOC occupations included had more than 20 per cent at NQF 6 and above, as well as more than 30 per cent at NQF Levels 2 and 3. This pattern suggests that the occupations are filled by a combination of over qualified holders of first degree and above qualifications and under qualified holders of NQF Levels 2 and 3 qualifications. This, in turn, potentially suggests a shortage of supply at the NQF Levels 4 and 5 in these occupations.

IT operations technicians were the most likely to be qualified at NQF Level 6 and above, or first degree and above. Computer engineers, installation and maintenance were the least likely to be qualified at NQF Level 6 and above, at 21.1

per cent. Medical and dental technicians were the most likely to be qualified at NQF Levels 2 or 3.

Despite the criteria that 20 per cent or more had to be qualified to NQF Level 6 and above, almost comparable proportions had qualifications below NQF Level 2 or no qualifications. This possibly reflects people who have 'learnt on the job' and have not obtained the appropriate qualifications. However, it also suggests a worrying extent of under qualification in these critical occupations. Over one in five (20.3 per cent) of the computer engineers, installation and maintenance had sub NQF Level 2 qualifications. At the same time, over one in 10 (10.3 per cent) of the building and civil engineering technicians, had other lower or no qualifications as did almost one in five (19.8 per cent) of quality assurance technicians. The relatively large proportion of these Level 4 SET based technician occupations that are under qualified, suggests a substantial scope for the provision of workplace delivered and assessed NVQ qualifications. Using the Assess Train Assess model these people, who hopefully have the necessary competencies, could be qualified relatively rapidly.

Table 2.2: Level 4 SET based technicians levels of qualification

	NQF first degree & above plus teaching qualifications	Other NQF Levels 4 and 5	NQF Levels 2 and 3	Other lower or no qualifications
Laboratory technicians	33.3	15.7	37.2	13.8
Building and civil engineering technicians	24.1	28.5	37.1	10.3
Quality assurance technicians	25.4	16.2	38.6	19.8
Science and engineering technicians n.e.c.	24.7	14.3	41.6	19.4
IT operations technicians	35.9	13.5	34.2	16.5
IT user support technicians	29.3	13.8	41.9	15.1
Medical and dental technicians	29.6	16.9	42.7	10.7
Computer engineers, installation and maintenance	21.1	13.6	44.9	20.3

Source: IES analysis of the 2007 to 2009 LFS

2.3 Gender

Table 2.3 provides a gender breakdown of the Level 4 SET based technicians. Two of the four digit SOC 2000 occupations, building and civil engineering technicians and computer engineers, installation and maintenance, had such a large proportion of males (90.6 and 95.6 per cent respectively) that the numbers of females had to be suppressed as they were less than 3,000. However, the laboratory technicians and medical and dental technicians had more females than

males, with males representing 45.6 and 41.4 per cent of the total respectively. The other Level 4 SET based technician occupations had the percentage of males in between 70 and 80 per cent.

Table 2.3: Gender breakdown of Level 4 SET based technicians

	Male	Female	Total	% Male
Laboratory technicians	29,242	34,920	64,162	45.6
Building and civil engineering technicians	23,205	* *	25,613	90.6
Quality assurance technicians	14,730	4,038	18,768	78.5
Science and engineering technicians n.e.c.	31,972	9,624	41,596	76.9
IT operations technicians	93,948	27,815	121,763	77.2
IT user support technicians	44,097	14,923	59,020	74.7
Medical and dental technicians	13,969	19,785	33,754	41.4
Computer engineers, installation and maintenance	39,765	* *	41,614	95.6

Source: IES analysis of the 2007 to 2009 LFS

2.4 Age

Table 2.4 provides an age breakdown of the Level 4 SET based technicians. This shows that the IT user support technicians had the youngest profile with over two-thirds (67.3 per cent) under 39 years old. By comparison, 28.6 per cent of the science and engineering technicians not elsewhere classified (n.e.c.) and 28.5 per cent of quality assurance technicians were over 50 years old.

Table2.4: Age breakdown of Level 4 SET based technicians

	16-29	30-39	40-49	50-64
Laboratory technicians	28.3	22.9	27.0	21.8
Building and civil engineering technicians	33.0	28.7	14.2	24.1
Quality assurance technicians	17.7	29.1	24.7	28.5
Science and engineering technicians n.e.c.	21.2	19.6	30.6	28.6
IT operations technicians	31.8	29.6	25.4	13.2
IT user support technicians	35.0	32.3	21.8	10.9
Medical and dental technicians	22.8	24.2	27.8	25.2
Computer engineers, installation and maintenance	32.7	28.3	25.6	13.4

Source: IES analysis of the 2007 to 2009 LFS

2.5 Demographics

In an effort to explore the demographic dynamics between 2001 to 2003 and 2007 to 2009, the 2001 to 2003 population was aged five years and the resulting age

structure compared with the actual age structure in 2007 to 2009. Given the five year gap between the two populations, this aging of the older population profile by five years reflects the actual aging of the former population. This means that the increases in age band populations reflect net movements into the occupation within the age range, and decreases in the age band reflect net movements out of the occupation. These movements are then expressed in terms of percentages of the total population for the occupation to allow comparisons between the occupations.

This data is presented in Table 2.5 and shows that the building and civil engineering technicians have the largest inflows at the 16 to 29 year old range and the largest outflows in the 45 to 64 year old range. All of the occupations have some inflow in the 16 to 29 year old range and all have some outflow in the 45 to 64 year old range. This reflects movement into these occupations following training and movement out into retirement and other occupations at the older age ranges. The quality assurance technicians have the lowest inflow at the 16 to 29 year old age range. This probably reflects movement into this occupation predominantly from other occupations rather than from initial training. The IT user support technicians have proportionally the largest outflow in the 30 to 44 year old age range reflecting the overall decline in numbers of this occupation and the transition to other occupations.

Table2.5: Percentage change in numbers of Level 4 SET based technicians, by age band

	16-29	30-44	45-64
Laboratory technicians	10.4	-11.7	-18.1
Building and civil engineering technicians	22.1	3.8	-34.3
Quality assurance technicians	7.6	-10.1	-13.2
Science and engineering technicians n.e.c.	8.1	-7.7	-16.2
IT operations technicians	15.3	-15.1	-7.4
IT user support technicians	9.7	-27.3	-8.7
Medical and dental technicians	15.9	-11.1	-11.5
Computer engineers, installation and maintenance	11.8	-17.8	-6.1

Source: IES analysis of the 2001 to 2003 and 2007 to 2009 LFS

2.6 Ethnicity

Table 2.6 provides an analysis of the ethnicity of the Level 4 SET based technician occupations. This shows that the building and civil engineering technicians are the most white, with 95.2 per cent reporting themselves in this ethnic group. By

comparison, the most non-white occupation were the computer engineers, installation and maintenance and the IT operations technicians.

Table2.6: Ethnicity breakdown of Level 4 SET based technicians

	White	Non-white	% White
Laboratory technicians	57,571	6,554	89.8
Building and civil engineering technicians	24,376	* *	95.2
Quality assurance technicians	17,546	* *	93.5
Science and engineering technicians n.e.c.	38,445	* *	92.4
IT operations technicians	106,645	15,119	87.6
IT user support technicians	52,303	6,656	88.7
Medical and dental technicians	31,582	* *	93.6
Computer engineers, installation and maintenance	36,483	5,130	87.7

Source: IES analysis of the 2007 to 2009 LFS

2.7 Incidence of training

The final table based on the UK LFS describing the Level 4 SET based technicians is Table 2.7. This table shows the proportion of each occupation reporting work related training in the last 13 weeks, or last three months. The occupation reporting the highest incidence of training was the medical and dental technicians. This possibly reflects a greater tradition of Continuing Professional Development (CPD) within the medical area. The occupation with the least reported incidence of training was the science and engineering technicians n.e.c. and the quality assurance technicians, where respectively 25.5 per cent and 22.7 per cent reported training in the last 13 weeks.

Table 2.7: Training and Level 4 SET based technicians

	Yes		No	
	N	%	N	%
Laboratory technicians	19,176	30.1	44,622	69.9
Building and civil engineering technicians	8,875	35.2	16,309	64.8
Quality assurance technicians	4,269	22.7	14,499	77.3
Science and engineering technicians n.e.c.	10,543	25.5	30,854	74.5
IT operations technicians	34,277	28.4	86,459	71.6
IT user support technicians	18,877	32.1	39,898	67.9
Medical and dental technicians	14,127	42.1	19,437	57.9
Computer engineers, installation and maintenance	11,361	27.6	29,865	72.4

Source: IES analysis of the 2007 to 2009 LFS

2.8 Hourly income from ASHE

Another data source was used to examine the median and mean hourly earning without overtime. Table 2.8 uses data from the Annual Survey of Hours and Earnings (ASHE). This comparator was selected as it is least influenced by the hours worked or the extent of overtime. Given the usually highly skewed distribution of earnings data, it is more usual to compare the median earnings rather than the mean or average earnings. The median earning is also the 50 percentile and half way along the distribution.

This table shows that the Level 4 SET based technician occupation with the lowest median earnings, at £10.58 per hour, was the laboratory technicians. It is possibly significant that this was also the occupation with the highest proportion of females. The most highly paid (in terms of the median salary) occupation was the IT operations technicians. Since the salaries offered are sometimes taken as a measure of labour market stress and hence shortage, this could also suggest that this was where the main shortage was.

Table 2.8: Hourly income of Level 4 SET based technicians

SOC Codes		Median hourly earnings without overtime £	Mean hourly earnings without overtime £
3111	Laboratory technicians	10.58	11.97
3114	Building and civil engineering technicians	12.77	13.42
3115	Quality assurance technicians	12.73	13.55
3119	Science and engineering technicians n.e.c.	11.52	12.30
3131	IT operations technicians	14.55	15.96
3132	IT user support technicians	12.51	13.48
3218	Medical and dental technicians	13.73	14.64
5245	Computer engineer, installation and maintenance	13.13	14.01

Source: Annual Survey of Hours and Earnings (ASHE) 2009

2.9 Summary of UK Level 4 SET technicians

A number of important features emerge from the above analyses:

- Despite being partially defined in terms of a high proportion with relatively high level qualifications, there is still a substantial minority with very low or no qualifications.

- Laboratory technicians as well as medical and dental technicians had the highest proportions of females at about 45 and 40 per cent respectively, while the other Level 4 SET technician occupations were predominantly male.
- Quality assurance technicians were the least likely to see inflows in the 16 to 29 year old ranges, while building and civil engineering technicians were the most likely.
- Medical and dental technicians were the most likely to have received training and quality assurance technicians the least likely to have received training in the previous 13 weeks.
- IT operations technicians had the highest average earnings and laboratory technicians had the lowest.

3 Level 3 SET Based Technicians

This chapter examines the labour market characteristics of Level 3 SET based technicians. These are SET based technicians whose occupations generally only require a NQF Level 3 qualification. Section 1.2.7 provides details of the detailed occupations included in this category. The process used to identify this group of occupation is outlined in Section 1.2. However, in summary this involved the examination of detailed occupational titles and associated job titles in SOC Major Groups 3 and 5. The dominant highest educational level for each occupation was then used to divide these SET based technician occupations into those centred around NQF Level 3 and NQF Level 4. This chapter examines the SET technician occupations predominantly at NQF Level 3.

3.1 Numbers

Table 3.1 provides the numbers within each Level 3 SET based technician occupation in 2001 to 2003 and 2007 to 2009 as well as the percentage change between the two periods. The Level 3 SET based technician occupation showing the greatest growth at 47.2 per cent was pharmaceutical dispensers. On the other hand, the occupations showing the greatest contraction at –46.1 per cent were the tool-makers, tool-fitters and markers-out.

Table 3.1: Numbers of Level 3 SET based technicians

	2001 to 2003	2007 to 2009	% Change
Electrical/electronics technicians	34,969	29,545	-15.5
Engineering technicians	68,521	69,022	0.7
Pharmaceutical dispensers	25,756	37,908	47.2
Precision instrument makers and repairers	26,753	19,816	-25.9
Telecommunications engineers	56,935	47,347	-16.8
Lines repairers and cable jointers	13,349	14,446	8.2
Sheet metal workers	32,066	22,710	-29.2
Welding trades	86,283	82,719	-4.1
Pipe fitters	14,845	12,734	-14.2
Metal machine setter and setter operator	93,505	60,631	-35.2
Tool-makers, tool-fitters and markers-out	31,936	17,218	-46.1
Electricians and electrical fitters	238,049	243,025	2.1
Electrical and electronic engineer n.e.c.	100,557	89,603	-10.9
Plumbing, heating and ventilating engineers	163,785	195,723	19.5

Source: IES analysis of the 2001 to 2003 and 2007 to 2009 LFS

3.2 Levels of qualification

Reflecting the selection criteria for Level 3 SET based technicians, all the four digit SOC 2000 occupations within this group had more than half at NQF Levels 2 and 3. As this is the level of qualification attained by Foundation Modern Apprentices, this explains the name given to this group of SET technicians. Despite the selection criteria, 14.5 per cent of the engineering technicians were qualified to NQF Level 6 and above. On the other hand, 78.8 per cent of the tool-makers, tool-fitters and markers-out were qualified to NQF Levels 2 and 3. Interestingly, 31.3 per cent of the welding trades and 31.1 per cent of the metal machine setter and setter operators were qualified at less than NQF Level 2 or had no formal qualifications.

Table 3.2: Level 3 SET based technicians levels of qualifications

	NQF first degree & above plus teaching qualifications	Other NQF Levels 4 and 5	NQF Levels 2 and 3	Other lower or no qualifications
Pharmaceutical dispensers	8.4	6.8	68.2	16.6
Electrical/electronics technicians	13.8	17.3	55.1	13.8
Engineering technicians	14.5	18.1	55.8	11.6
Precision instrument makers and repairers	5.7	17.9	57.2	19.3
Telecommunications engineers	6.2	12.9	55.8	25.1
Lines repairers and cable jointers	0.4	2.8	67.9	28.8
Sheet metal workers	1.1	3.4	66.2	29.3
Welding trades	0.9	3.1	64.8	31.3
Pipe fitters	3.3	7.0	68.3	21.4
Metal machine setter and setter operator	0.5	5.4	63.0	31.1
Tool-makers, tool-fitters and markers-out	0.6	7.5	78.8	13.0
Electricians and electrical fitters	3.1	8.1	78.2	10.6
Electrical and electronic engineer n.e.c.	8.2	15.8	56.2	19.9
Plumbing, heating and ventilating engineers	2.2	4.5	77.0	16.4

Source: IES analysis of the 2007 to 2009 LFS

3.3 Gender

Table 3.3 provides a gender breakdown of the Level 3 SET based technician occupations. This shows that apart from the pharmaceutical dispensers all of the Level 3 SET based occupations were over 90 per cent male. Given that the weighted numbers of females in all of these occupations were below 3,000, the actual differences between these occupations are largely unreliable. The pharmaceutical dispensers on the other hand are almost totally female and there are similar cautions about the relative number of male pharmaceutical dispensers.

Table 3.3: Gender breakdown of Level 3 SET based technicians

	Male	Female	Total	% Male
Pharmaceutical dispensers	* *	35,426	37,908	* *
Electrical/electronics technicians	26,830	* *	29,546	90.8
Engineering technicians	66,126	* *	69,021	95.8
Precision instrument makers and repairers	19,138	* *	19,816	96.6
Telecommunications engineers	46,076	* *	47,347	97.3
Lines repairers and cable jointers	14,445	* *	14,445	100.0
Sheet metal workers	22,478	* *	22,711	99.0
Welding trades	81,715	* *	82,719	98.8
Pipe fitters	12,697	* *	12,733	99.7
Metal machine setter and setter operator	58,118	* *	60,630	95.9
Tool-makers, tool-fitters and markers-out	17,148	* *	17,218	99.6
Electricians and electrical fitters	241,313	* *	243,024	99.3
Electrical and electronic engineer n.e.c.	87,463	* *	89,602	97.6
Plumbing, heating and ventilating engineers	194,574	* *	195,722	99.4

Source: IES analysis of the 2007 to 2009 LFS

3.4 Age

The age breakdown of the Level 3 SET based technician occupations is provided by Table 3.4. This shows that the age profile of the tool-makers, tool-fitters and markers-out shows the smallest proportion of 16 to 29 year olds and 42.0 per cent within the 50 to 64 year old age range. This suggests a seriously aging occupation. This combined with the overall decrease in numbers in the occupation further suggests an occupation being phased out. Given that CAD/CAM techniques have removed the need for many of the functions undertaken by tool-makers, tool-fitters and markers-out, this is a plausible explanation. Another occupation with an interesting age profile was the pipe fitters. The pipe fitters have virtually one-third (33.2 per cent) of the occupation in the youngest age range and a further 30.0 per cent in the oldest age range. This suggests an occupation that until recently was in decline but recently has seen a growth in numbers. The pharmaceutical dispensers were the occupation with the smallest proportion (18.4 per cent) in the oldest age range of 50 to 64 year olds. This might represent a relatively new occupation which means that there are relatively few who were trained 30 years or so ago. These hypotheses are explored in more detail in the subsequent demographic table.

Table 3.4: Age breakdown of Level 3 SET based technicians

	16-29	30-39	40-49	50-64
Pharmaceutical dispensers	31.7	19.6	30.4	18.4
Electrical/electronics technicians	21.8	23.8	26.3	28.1
Engineering technicians	25.4	22.1	26.3	26.2
Precision instrument makers and repairers	25.2	23.4	22.4	29.0
Telecommunications engineers	16.5	22.9	29.3	31.3
Lines repairers and cable jointers	16.0	24.8	37.6	21.6
Sheet metal workers	27.8	20.0	26.8	25.4
Welding trades	27.6	18.3	25.9	28.2
Pipe fitters	33.2	20.8	16.0	30.0
Metal machine setter and setter operator	15.6	21.0	27.2	36.2
Tool-makers, tool-fitters and markers-out	11.6	15.4	31.0	42.0
Electricians and electrical fitters	31.7	23.1	20.1	25.1
Electrical and electronic engineer n.e.c.	21.3	24.6	26.7	27.5
Plumbing, heating and ventilating engineers	30.4	20.7	22.6	26.3

Source: IES analysis of the 2007 to 2009 LFS

3.5 Demographics

As outlined previously, this section examines the inflows and outflows from each occupation by age band by aging the data from 2001 to 2003 by five years, and comparing this with the 2007 to 2009 data. To aid comparative analysis, this data is then expressed in terms of percentages of the 2007 to 2009 total numbers.

Table 3.5 therefore shows the relative inflows and outflows for each of the Level 3 SET based technician occupations. This in turn shows that, as predicted by the age structure, that the tool-makers, tool-fitters and markers-out show a decline in numbers over the five year period in each of the age bands. This suggests an occupation in terminal decline. Another occupation with a similarly declining profile is that of the metal machine setter and setter operators, which has significant declines in the 30 to 44 and 45 to 64 year old age bands, but a modest increase in the 16 to 29 year old age band. The pharmaceutical dispensers have the greatest growth profile with the greatest growth in the 16 to 29 year old age band and the smallest decline in the 45 to 64 year old age band.

Table 3.5: Percentage change in numbers of Level 3 SET based technicians, by age band

	16-29	30-44	45-64
Pharmaceutical dispensers	17.1	8.6	-0.2
Electrical/electronics technicians	8.5	-13.9	-23.4
Engineering technicians	13.0	-8.0	-13.8
Precision instrument makers and repairers	3.7	-7.8	-42.0
Telecommunications engineers	6.2	-18.1	-20.0
Lines repairers and cable jointers	9.1	-10.0	-1.9
Sheet metal workers	8.7	-31.5	-32.7
Welding trades	9.0	-6.5	-16.6
Pipe fitters	16.7	-12.4	-27.2
Metal machine setter and setter operators	1.3	-16.9	-52.3
Tool-makers, tool-fitters and markers-out	-10.9	-23.3	-68.2
Electricians and electrical fitters	12.1	-6.2	-13.5
Elec and electronic engineer n.e.c.	6.3	-12.8	-15.8
Plumbing, heating and ventilating engineers	16.4	3.2	-10.7

Source: IES analysis of the 2001 to 2003 and 2007 to 2009 LFS

3.6 Ethnicity

Table 3.6 examines the pattern of ethnicity amongst the Level 3 SET based technician occupations. This shows that, as far as can be told, given the problems with the small (and suppressed) numbers of females, that the electrical/ electronics technicians had the greatest proportion of ethnic minorities. At the same time, and with the same cautions, the data also suggests that the pipefitters were the most white of the Level 3 SET based technician occupations.

Table 3.6: Ethnicity breakdown of Level 3 SET based technicians

	White	Non-white	% White
Pharmaceutical dispensers	35,092	* *	92.6
Electrical/electronics technicians	27,243	* *	92.2
Engineering technicians	67,101	* *	97.2
Precision instrument makers and repairers	19,279	* *	97.3
Telecommunications engineers	44,086	3,148	93.3
Lines repairers and cable jointers	14,365	* *	99.4
Sheet metal workers	22,048	* *	97.1
Welding trades	79,750	* *	96.5
Pipe fitters	12,692	* *	99.7
Metal machine setter and setter operator	58,104	* *	95.8
Tool-makers, tool-fitters and markers-out	16,487	* *	95.8
Electricians and electrical fitters	234,826	8,094	96.7
Electrical and electronic engineer n.e.c.	84,350	5,252	94.1
Plumbing, heating and ventilating engineers	187,976	7,699	96.1

Source: IES analysis of the 2007 to 2009 LFS

3.7 Incidence of training

Table 3.7 shows the reported incidence of work related training over the last 13 weeks by each of the Level 3 SET based technician occupations. This shows that the pharmaceutical dispensers had the highest reported incidence of training with 44.7 per cent reporting training. This reinforces the pattern of high levels of CPD amongst the medical occupations. The occupation with the smallest proportion reporting training was the metal machine setter and setter operators. At the same time, the other declining occupation tool-makers, tool-fitters and markers-out probably had a smaller proportion reporting training, but this is within the range of uncertainty generated by the small sample size.

Table 3.7: Training and Level 3 SET based technicians

	Yes		No	
	N	%	N	%
Pharmaceutical dispensers	16,826	44.7	20,834	55.3
Electrical/electronics technicians	7,250	24.5	22,295	75.5
Engineering technicians	24,544	35.7	44,128	64.3
Precision instrument makers and repairers	4,787	24.3	14,927	75.7
Telecommunications engineers	14,414	30.6	32,664	69.4
Lines repairers and cable jointers	5,027	34.8	9,418	65.2
Sheet metal workers	* *	* *	19,740	86.9
Welding trades	14,992	18.2	67,380	81.8
Pipe fitters	* *	* *	9,953	78.9
Metal machine setter and setter operator	8,046	13.3	52,584	86.7
Tool-makers, tool-fitters and markers-out	* *	* *	15,718	91.3
Electricians and electrical fitters	68,707	28.4	173,536	71.6
Electrical and electronic engineer n.e.c.	26,438	29.6	62,868	70.4
Plumbing, heating and ventilating engineers	51,286	26.3	143,546	73.7

Source: IES analysis of the 2007 to 2009 LFS

3.8 Hourly income from ASHE

This final table (Table 3.8) presents data on the median and mean hourly non-overtime earnings of the Level 3 SET based technician occupations from the ASHE. This shows the occupation with the lowest median hourly salary is also the occupation with the highest proportion of females, the pharmaceutical dispensers. The engineering technicians had the highest median salary, and at £15.00 per hour this was almost twice the median salary of £8.20 earned by the pharmaceutical dispensers.

Table 3.8: Hourly income of Level 3 SET based technicians

SOC Codes		Median hourly earnings without overtime £	Mean hourly earnings without overtime £
3217	Pharmaceutical dispensers	8.20	9.03
3112	Electrical/electronics technicians	14.24	13.81
3113	Engineering technicians	15.00	15.52
5224	Precision instrument makers and repairers	10.88	12.39
5242	Telecommunications engineers	13.18	14.14
5243	Lines repairers and cable jointers	14.72	15.03
5213	Sheet metal workers	10.48	11.18
5215	Welding trades	10.00	10.84
5216	Pipe fitters	14.12	14.34
5221	Metal machine setter and setter operator	11.32	11.82
5222	Tool-makers, tool-fitters and markers-out	11.19	11.12
5241	Electricians and electrical fitters	12.94	13.13
5249	Electrical and electronic engineer n.e.c.	11.76	12.70
5314	Plumbing, heating and ventilating engineers	12.88	13.15

Source: Annual Survey of Hours and Earnings (ASHE) 2009

3.9 Summary of UK Level 3 SET technicians

A number of important features emerge from the above analyses:

- The largest occupation within the Level 3 SET technician grouping was electricians and electrical fitters, but the fastest growing occupation was pharmaceutical dispensers.
- Electrical and electronics technicians were the most likely to have a qualification at NQF Levels 4 and above, while 31.3 per cent of welding trades had qualifications below NQF Level 2 or no qualifications.
- Apart from pharmaceutical dispensers where females dominate, the other Level 3 SET based technician occupations were dominated by males.
- The pharmaceutical dispensers were the most likely to have received training in the previous 13 weeks, while tool-makers, tool-fitters and markers-out were the least likely to have received training.
- On average, engineering technicians were paid the most and pharmaceutical dispensers the least.

4 European SET Based Technicians

The analysis in this chapter is based on the various national Labour Force Surveys which are co-ordinated and collated by Eurostat to provide comparable data allowing European analyses.

As outlined in Section 1.3, the occupations in the comparable ELFS is coded using the ISCO (International Labour Organisation (ILO), 1988) and in practice a specific variant of ISCO known as ISCO (COM). Using this classification, we have developed a comparable selection of occupations to that used in the preceding chapters using SOC 2000. These ISCO occupations are as follows:

- ISCO 311 – physical and engineering science technicians.
- ISCO 312 – computer associate technicians.
- ISCO 313 – optical and electronic equipment operators.
- ISCO 314 – ship and aircraft controllers and technicians.
- ISCO 315 – safety and quality inspectors.
- ISCO 321 – life science technicians and related associate professionals.
- ISCO 322 – health associate professions (except nursing).

Each of these ISCO occupations is examined in turn below. Given the extra restrictions on analysing the European LFS and the reduced number of variables compared with the UK LFS, these analyses are necessarily less complex than the UK only analyses. However, the extra dimension of the European comparisons more than makes up for any lack of detail. The following chapter examines the situation country by country.

4.1 Physical and engineering science technicians

ISCO Category 311 covers physical and engineering science technicians. Table 4.1 provides details of the nine component four digit occupational groupings that make up ISCO 311. This provides a more rounded understanding of the types of occupations covered by this category.

Table 4.1: ISCO components of physical and engineering science technicians

ISCO four digit codes	Description
3111	Chemical and physical science technicians
3112	Civil engineering technicians
3113	Electrical engineering technicians
3114	Electronics and telecommunications engineering technicians
3115	Mechanical engineering technicians
3116	Chemical engineering technicians
3117	Mining and metallurgical technicians
3118	Draughtspersons
3119	Physical and engineering science technicians n.e.c.

Source: Eurostat ISCO 88 (COM) Documentation

4.1.1 Percentage of the workforce

Figure 4.1 shows the relative number of physical and engineering science technicians by country compared with all those in employment. In order to ease the reading of the following charts, Table 4.2 lists the country names and codes used for ease of reference. Where countries are not included in the charts their data has been suppressed due to low numbers and confidentiality concerns.

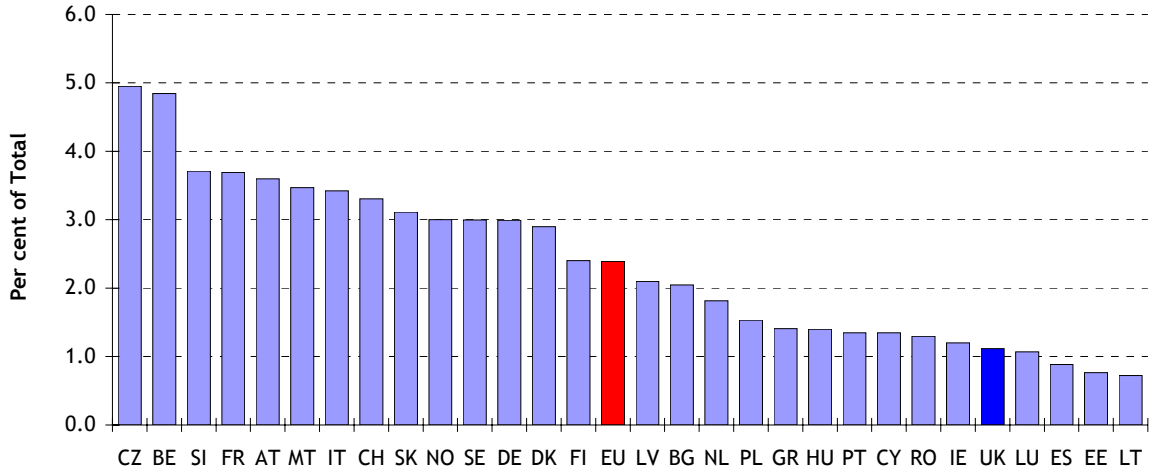
Table 4.2: Country names and codes

Name	Code	Name	Code	Name	Code	Name	Code
Austria	AT	Estonia	EE	Iceland	IS	Poland	PL
Belgium	BE	Spain	ES	Italy	IT	Portugal	PT
Bulgaria	BG	Finland	FI	Lithuania	LT	Romania	RO
Cyprus	CY	France	FR	Luxembourg	LU	Sweden	SE
Czech Republic	CZ	Greece	GR	Latvia	LV	Slovenia	SI
Germany	DE	Hungary	HU	Netherlands	NL	Slovakia	SK
Denmark	DK	Ireland	IE	Norway	NO	United Kingdom	UK

Source: International Standards Organisation Two Digit Codes

Figure 4.1 shows that in the UK, 1.1 per cent of the workforce is within this category. The UK proportion is less than a quarter of that found in the Czech Republic (CZ) and Belgium (BE), and less than half of the EU average. The only countries with a smaller proportion are Luxembourg (LU), Spain (ES), Estonia (EE), and Lithuania (LT). As this group of workers most clearly are SET technicians this apparent deficit is worrying.

Figure 4.1: Physical and engineering science technicians as a percentage of workforce, by country



Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.1.2 Percentage with intermediate level qualifications

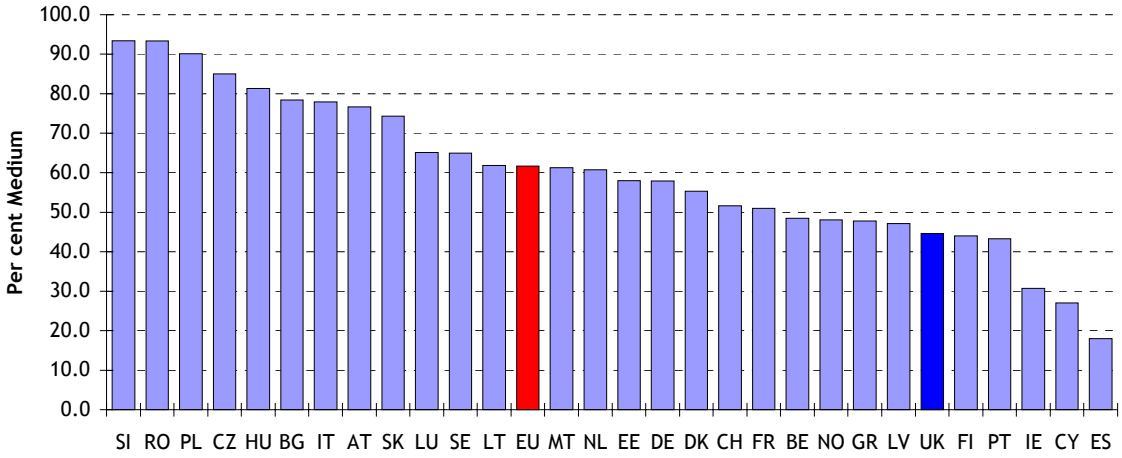
Figure 4.2 shows the percentage of the physical and engineering science technicians with an intermediate or medium level qualification. In UK terms, an intermediate level qualification represents A Levels and equivalents up to Higher National Diplomas (HNDs) and Foundation Degrees. Table 4.3 provides the UK equivalents to the Eurostat classification. Figure 4.2 shows that 47.1 per cent of the UK physical science and engineering technicians have an intermediate level qualification.

Table 4.3: UK and Eurostat reduced ISCED classification

Classification	Eurostat definition	UK equivalent
Low	Lower Secondary and below	GCSEs, NQF Level 2 and below
Intermediate	Upper Secondary	A Levels, NQF Level 3, HE Access courses
High	Tertiary Level	NQF Level 4 and 5, HNC, HND, First degree and above

Source: Eurostat and Schneider 2008

Figure 4.2: Physical and engineering science technicians percentage with intermediate level qualifications, by country



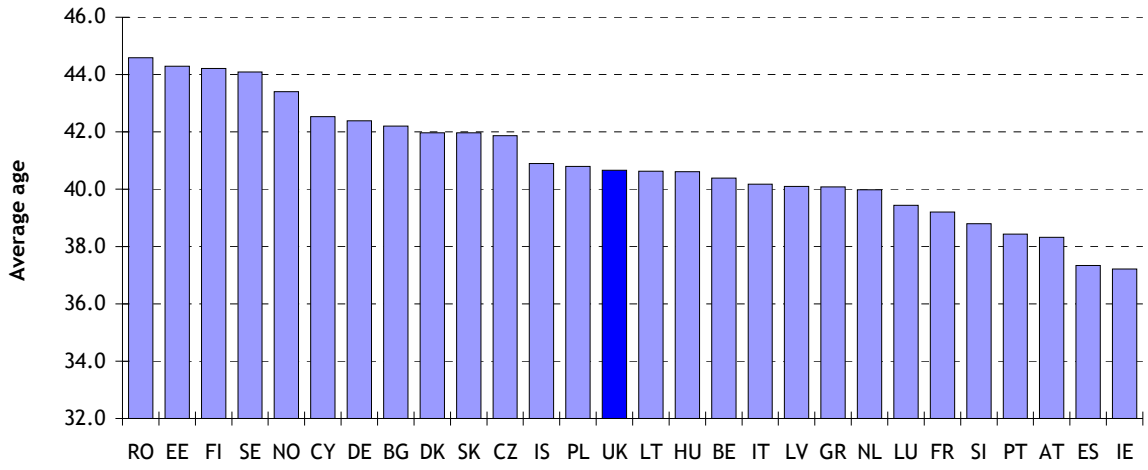
Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

This compares with an EU average of 61.7 per cent and figures of 93.4, 93.3 and 90.1 per cent for Slovenia (SI), Romania (RO) and Poland (PL) respectively. The relatively low proportion of intermediately qualified in the UK reflects a high number of people qualified at a high level within this occupation. The UK has a further 47.4 per cent of the physical science and engineering technicians qualified at a high level which compares with an EU average of 29.4 per cent.

4.1.3 Average age

An important aspect of determining whether supply is matching demand for SET technicians is to examine their average age. An older average age suggests less replacement by new entrants who tend to be younger. In the case of the physical science and engineering technicians, the UK's average age of 40.7 years is mid-range between Romania's (RO) 44.6 and Ireland's (IE) 37.2. Forty is relatively old which suggests a low replacement rate, but the UK's problems are not as bad as elsewhere.

Figure 4.3: Average age of physical and engineering science technicians

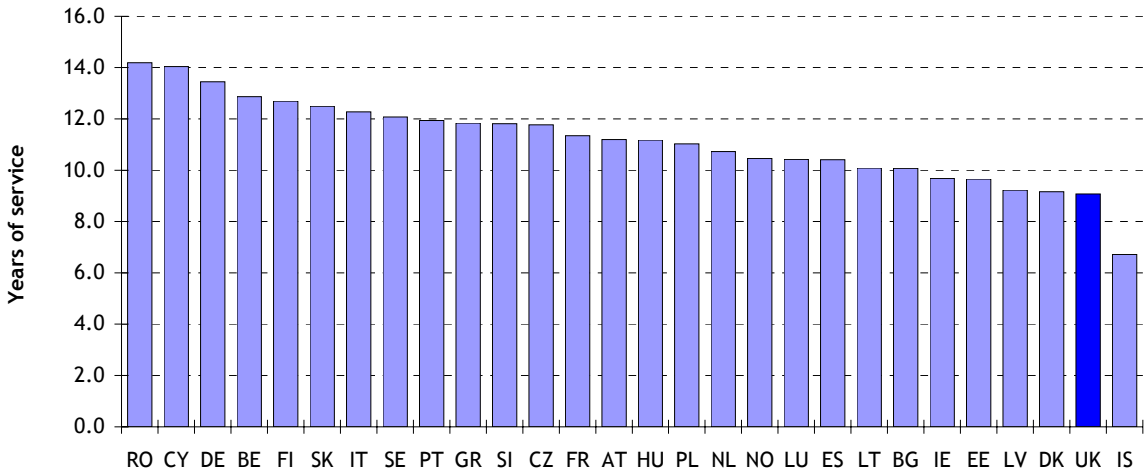


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.1.4 Length of service

Another way of looking at the extent of potential replacement demand is to look at the average length of service with their current employer. Here the average value for physical science and engineering technicians in the UK was 9.1 years which was less than in all the other countries apart from Iceland (IS). However, there is not a great deal of variation with Romania (RO) having the longest average length of service at 14.2 years.

Figure 4.4: Length of service of physical and engineering science technicians 2008



Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

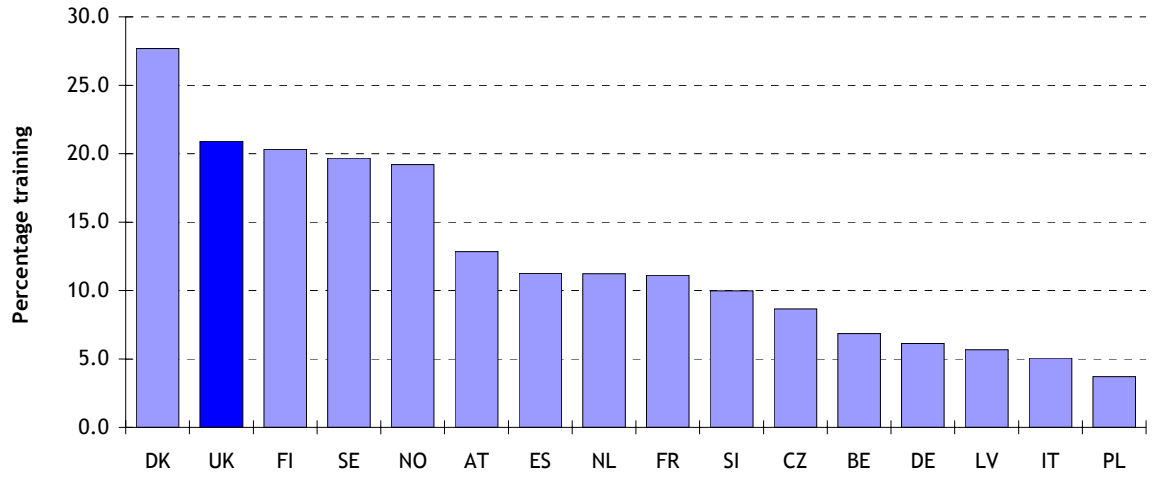
The pattern of short length of service in the UK might also be a reflection of a more flexible labour market with more mobility between employers. However, when analysed, no general pattern between the Organisation for Economic Co-operation

and Development's (OECD) labour market flexibility indicator and average length of service of physical and engineering science technicians could be found.

4.1.5 Percentage trained in last four weeks

Figure 4.5 shows the extent to which physical and engineering science technicians have been involved in some form of training over the four weeks before they were surveyed. This shows that over one-fifth of UK physical and engineering science technicians had undertaken training. This compared with over a quarter of the same group in Denmark (DK), and as few as four per cent getting training in Poland (PL).

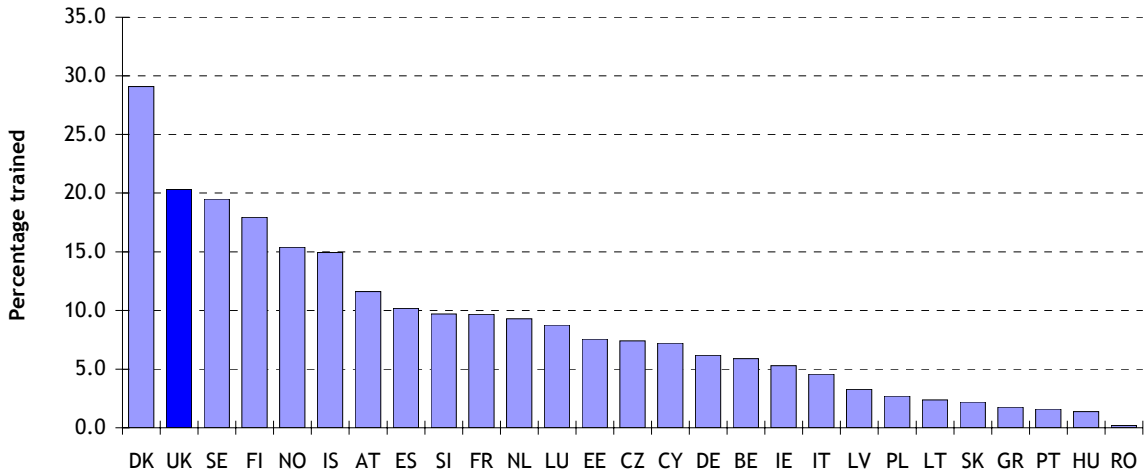
Figure 4.5: Percentage of physical and engineering science technicians trained in the last four weeks



Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

Largely, this pattern is due to national differences in the proclivity of employers to offer training as Figure 4.6 shows. Figure 4.6 provides an almost identical pattern as Figure 4.5 with the addition of more countries. This shows that training in employment is a particularly Scandinavian and UK phenomena.

Figure 4.6: Percentage of all employees trained in the last four weeks



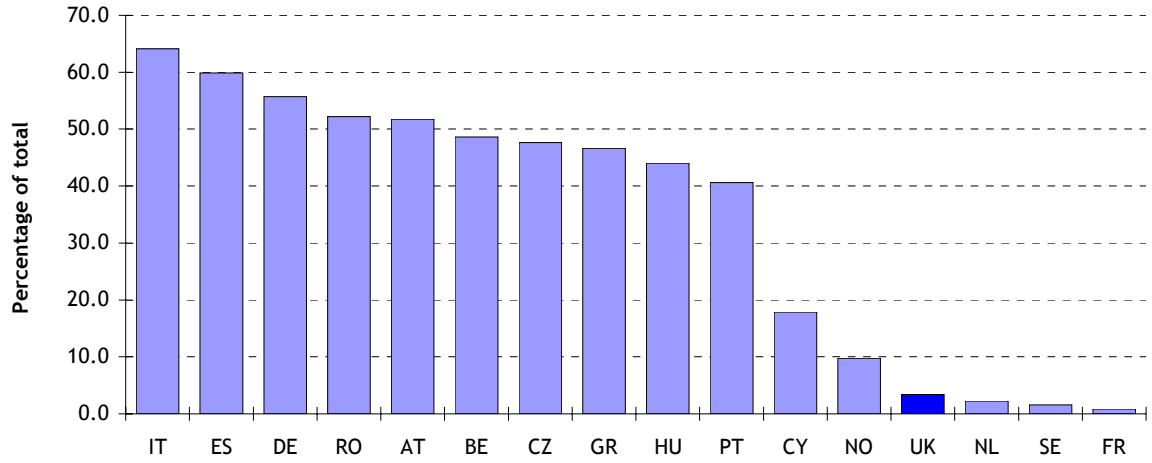
Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.1.6 Sectors of employment

Some of the SET technician occupations are sector specific, others are spread over a range of sectors, and overall the analysis is made more difficult by the limits to disaggregation implicit in the sample surveys underlying the data. However, physical and engineering science technicians are generally concentrated in manufacturing (Standard Industrial Classification of Economic Activities (SIC 2007 C)) and professional scientific and technical activities (SIC 2007 M). In a few countries with very small manufacturing sectors the concentration is in wholesale and retail trade, repair of motor vehicles and motorcycles (SIC 2007 G).

Notably in the UK, a comparatively small proportion of the physical and engineering science technicians are engaged in manufacturing or professional scientific and technical establishments. While in Italy (IT) almost two-thirds (64.1 per cent) and in Spain 59.9 per cent are in these sectors and nine countries have over 40 per cent in these sectors.

Figure 4.7: Percentage of physical and engineering technicians in manufacturing and professional, scientific and technical activities



Note: Countries not included in the analysis by IES have values too small to be reliable analysed.

Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.2 Computer associate technicians

ISCO category 312 covers computer associate technicians. Table 4.4 provides the component four digit ISCO occupations which provide a better understanding of the type of work done by those coded as computer associate technicians. Due to underlying Irish national occupational classifications, there is no data covering computer associate technicians from Ireland.

Table 4.4: ISCO components of computer associate technicians

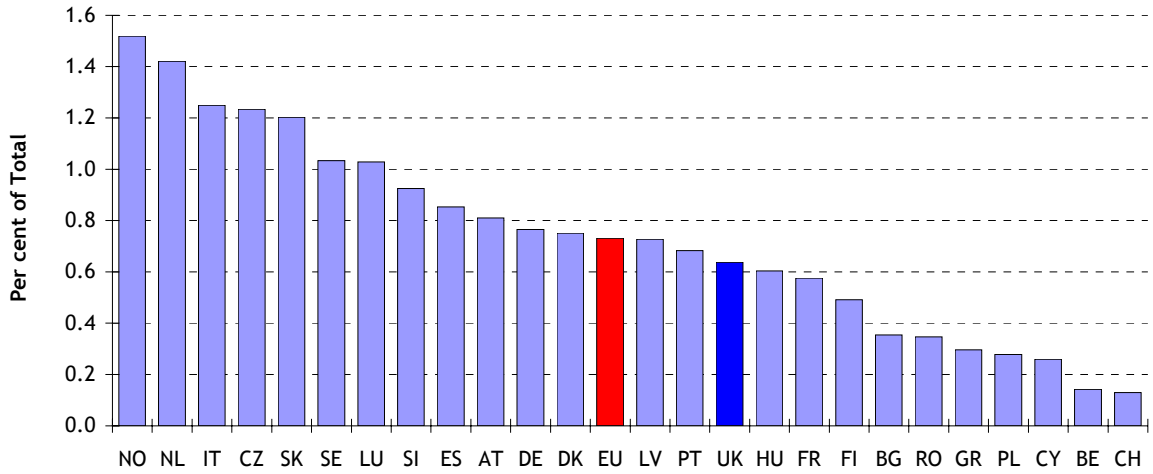
ISCO four digit codes	Description
3121	Computer assistants
3122	Computer equipment operators
3123	Industrial robot controllers

Source: Eurostat ISCO 88 (COM) Documentation

4.2.1 Percentage of the workforce

Figure 4.8 shows that the UK has computer associate technicians as a percentage of the workforce slightly less than the EU average. At 0.6 per cent of the workforce, the UK has proportionally half the computer associate technicians as Italy (IT) where they are 1.2 per cent of the workforce.

Figure 4.8: Computer associate technicians as a percentage of the workforce, by country

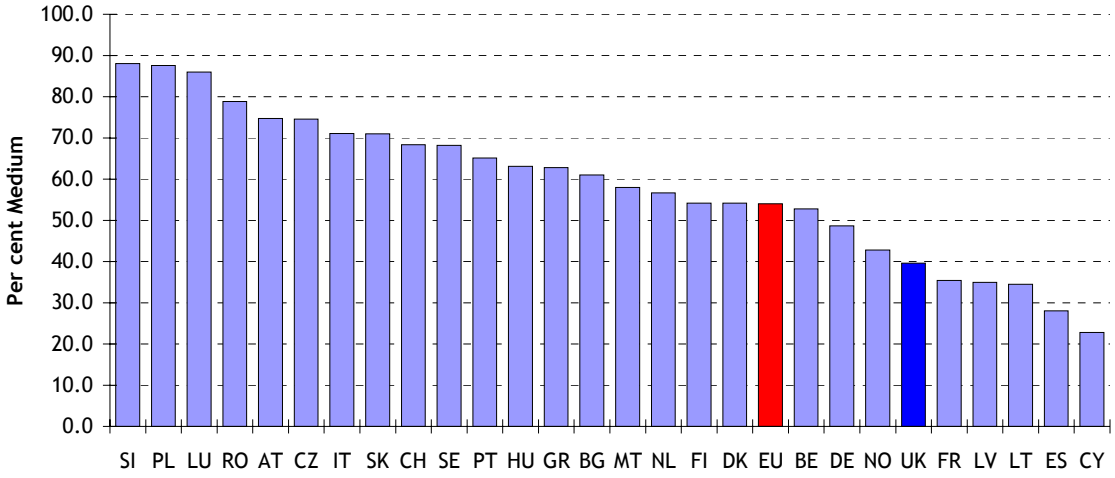


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.2.2 Percentage with intermediate level qualifications

The UK has fewer computer associate technicians with intermediate level qualifications than the EU average. Overall, the UK had 39.6 per cent with intermediate qualifications while Slovenia (SI), Poland (PL) and Luxembourg (LU) had a concentration of computer associate technicians with intermediate qualifications at 88.1, 87.6 and 86.0 per cent respectively.

Figure 4.9: Computer associate technicians percentage with an intermediate level qualification, by country

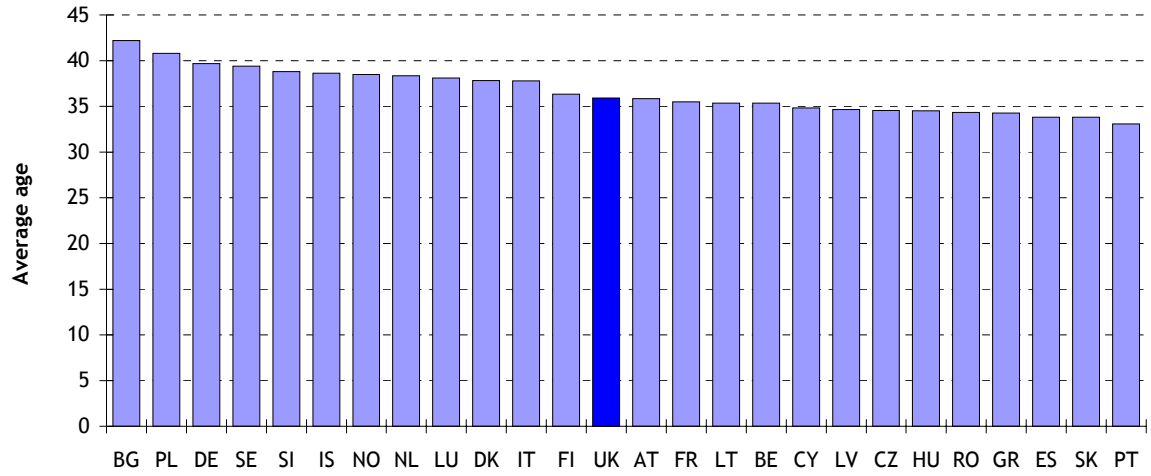


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.2.3 Average age

Generally, the average age of computer associate technicians is relatively similar across Europe with the UK's average age of 35.9 years at the mid-range.

Figure 4.10: Average age of computer associate technicians

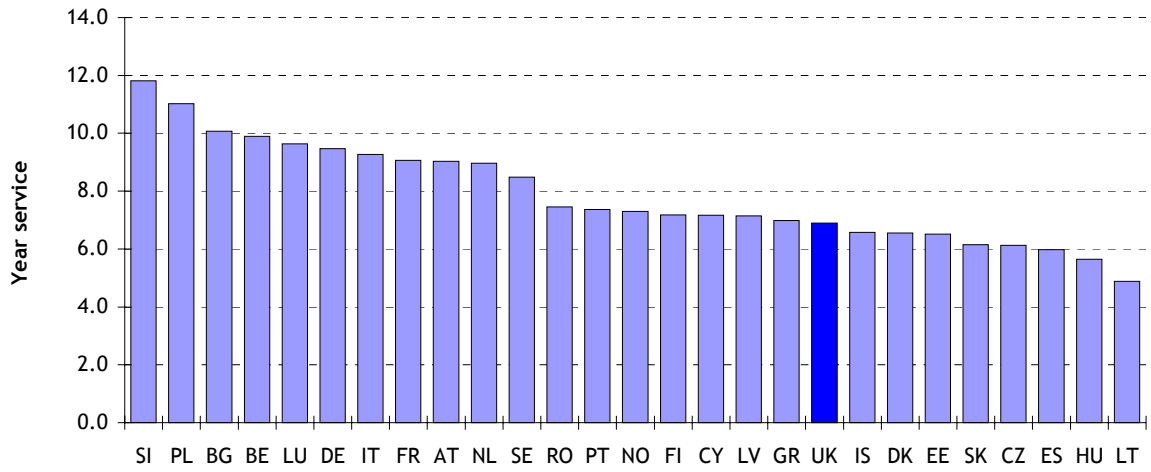


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.2.4 Length of service

Partly reflecting the lower average age of computer associate technicians, the average length of service is also lower. The UK at 6.9 years is at the lower one-third of the distribution. This compares with Slovenia (SI) and Poland (PL) at 11.8 and 11.0 years respectively.

Figure 4.11: Length of service of computer associate technicians

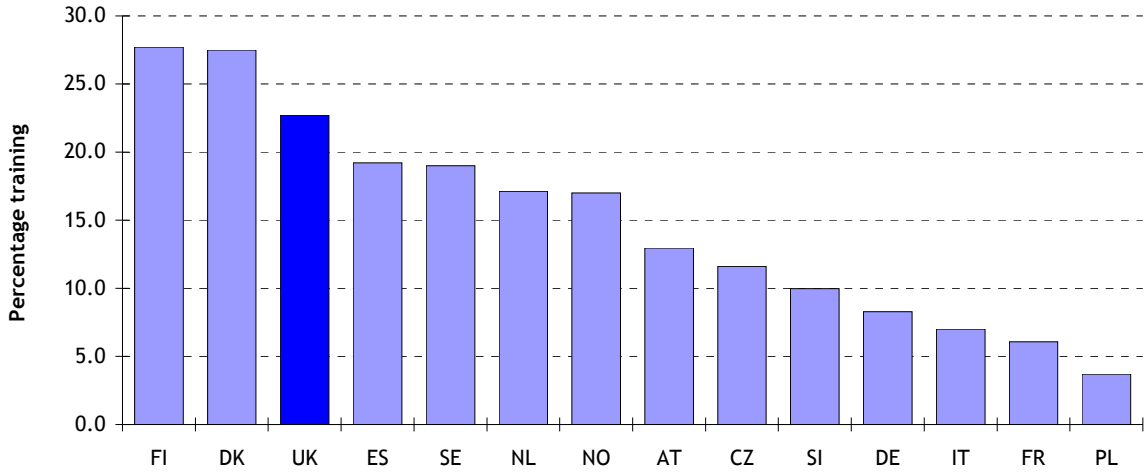


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.2.5 Percentage trained in last four weeks

Again, the UK has a relatively high incidence of training reflecting generally higher rates of training in the UK. In the UK, 22.7 per cent of computer associate technicians reported training in the last four weeks.

Figure 4.12: Percentage of computer associate technicians trained in the last four weeks



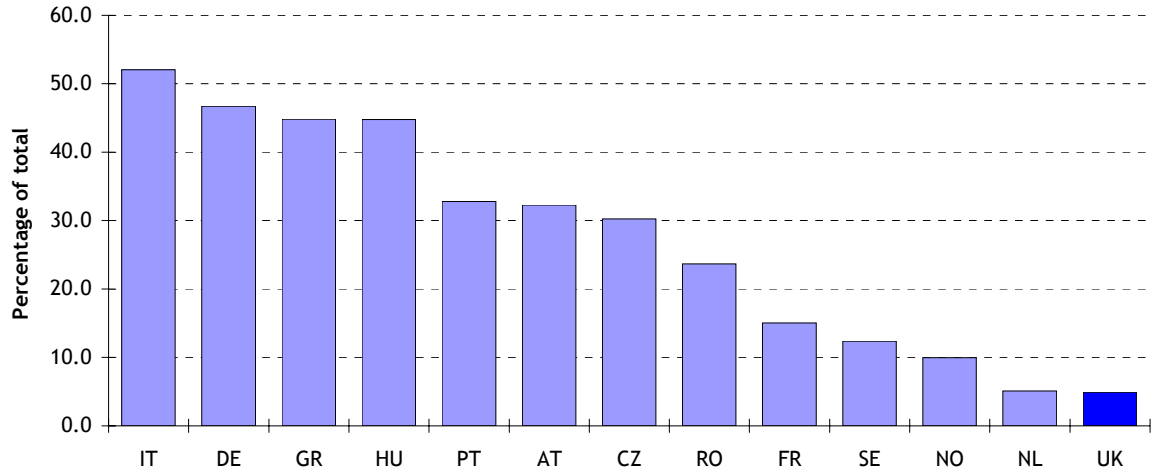
Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.2.6 Sectors of employment

As before, the sectors of employment filled by computer associate technicians tend to be specific to the occupation. This means that the most important sectors for computer associate technicians are transport and storage (SIC 2007 H) as well as information and communication (SIC 2007 J). Additionally at this level of disaggregation, differences in the underlying national occupational classifications start to become more apparent.

Figure 4.13 shows that of the reportable countries, the UK has the smallest percentage of computer associate technicians in the sectors where they would be expected to be concentrated. This suggests that they are more widely spread into IT using sectors.

Figure 4.13: Percentage of computer associate technicians in transport and storage as well as information and communications sectors



Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.3 Optical and electronic equipment operators

The ISCO category 313 covers optical and electronic equipment operators. Table 4.5 provides the details of the four digit ISCO occupations that make up this group of occupations.

Table 4.5: ISCO components of optical and electronic equipment operators

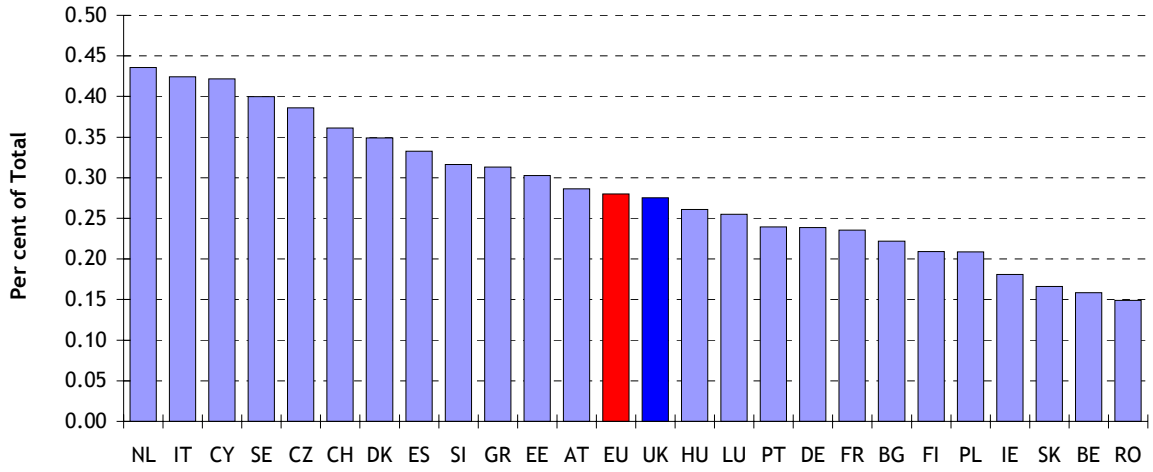
ISCO four digit codes	Description
3131	Photographers and image and sound recording equipment operators
3132	Broadcasting and telecommunications equipment operators
3133	Medical equipment operators
3139	Optical and electronic equipment operators n.e.c.

Source: Eurostat ISCO 88 (COM) Documentation

4.3.1 Percentage of the workforce

The UK has almost the same proportion of the workforce as optical and electronic equipment operators as the whole of the European Union. The UK has 0.28 per cent of the workforce in this category as does the EU. This is less than half the level in the Netherlands (NL) which had 0.44 per cent and less than twice the level in Romania (RO) which had 0.15 per cent.

Figure 4.14: Optical and electronic equipment operators as a percentage of workforce, by country

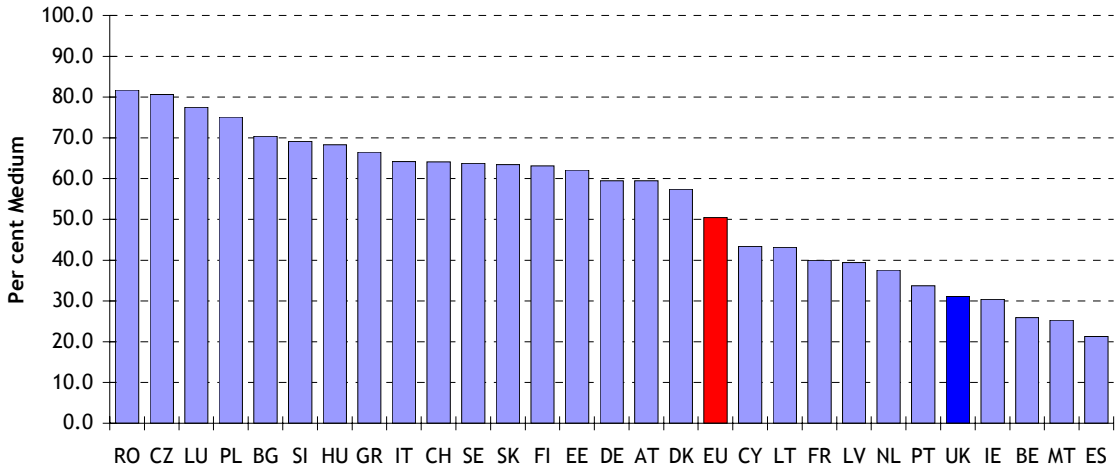


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.3.2 Percentage with intermediate level qualifications

In the UK, 31.1 per cent of optical and electronic equipment operators have intermediate level qualifications. This is less than the EU average where half (50.5 per cent) of those in these occupations had an intermediate level qualification. However, there is also clearly a central European tradition where much higher proportions of the optical and electronic equipment operators have intermediate qualifications with Romania (RO), the Czech Republic (CZ), Luxembourg (LU), Poland (PL) and Bulgaria (BG) all having more than 70 per cent of their optical and electronic equipment operators with intermediate level qualifications.

Figure 4.15: Optical and electronic equipment operators percentage with an intermediate level qualification, by country

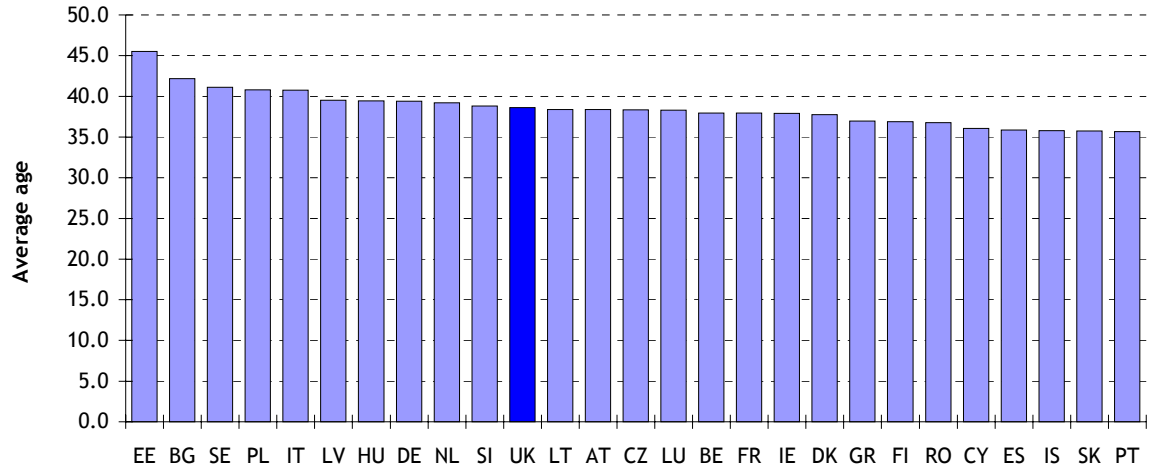


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.3.3 Average age

The average age of optical and electronic equipment operators is remarkably consistent across Europe, with little deviation from the UK's average of 38.6 years.

Figure 4.16: Average age of optical and electronic equipment operators

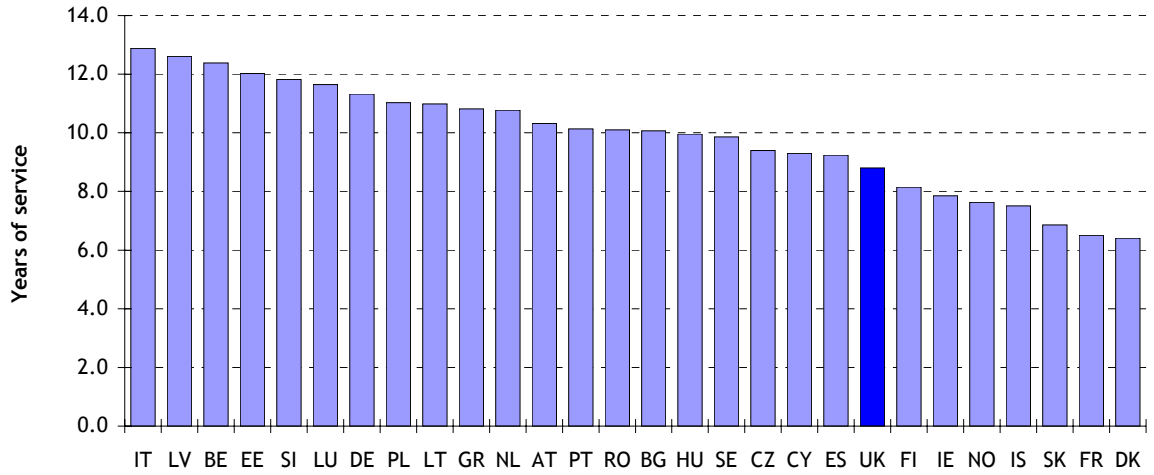


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.3.4 Length of service

However, there is greater variation in the average length of service of optical and electronic equipment operators. Those in the UK on average had been with their current employer for 8.8 years. This is on the lower end of the European range which ranged from Italy (IT) with 12.9 years and France with seven years.

Figure 4.17: Length of service of optical and electronic equipment operators

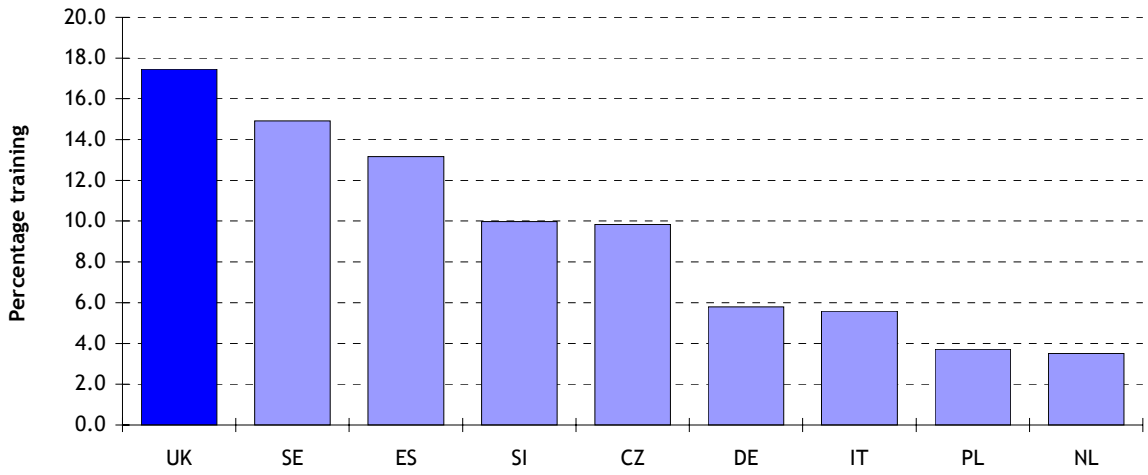


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.3.5 Percentage trained in last four weeks

Given the underlying national propensity to train, only nine countries generate data allowing the extent of training of optical and electronic equipment operators to be examined. Of these nine, the UK shows the greatest propensity to train, with just over 17 per cent of them reporting some form of training in the last four weeks before they were surveyed.

Figure 4.18: Percentage of optical and electronic equipment operators trained in the last four weeks

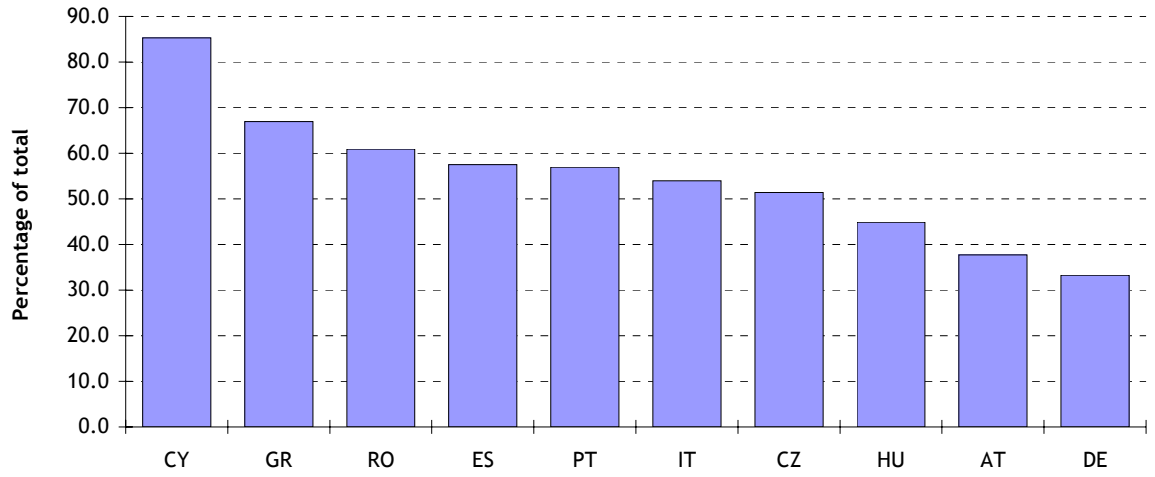


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.3.6 Sectors of employment

The important sectors for optical and electronic equipment operators are SIC 2007 J, information and communication, and SIC 2007 M, professional, scientific and technical activities. In Cyprus as many as 85.3 per cent of these occupations are to be found in these two sectors. However, in the UK these occupations are spread over many sectors and insufficient are found in these specific sectors to be reported.

Figure 4.19: Percentage of optical and electronic equipment operators in information and communication as well as professional, scientific and technical activities



Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.4 Ship and aircraft controllers and technicians

The ISCO category 314 covers ship and aircraft controllers and technicians. As before, the types of occupations covered by this definition are more clearly outlined in Table 4.6 which lists the four digit occupations within this category.

Table 4.6: ISCO components of ship and aircraft controllers and technicians

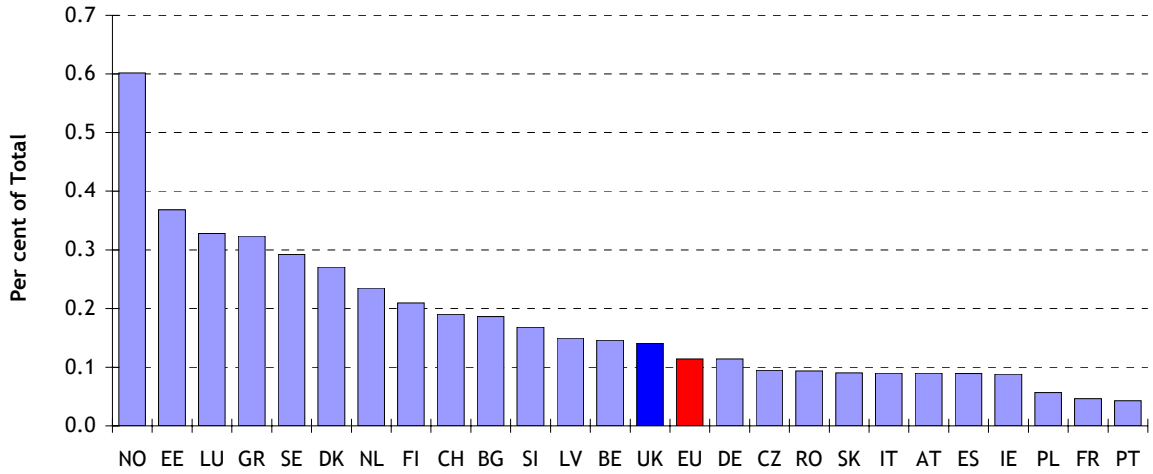
ISCO four digit codes	Description
3141	Ships' engineers
3142	Ships' deck officers and pilots
3143	Aircraft pilots and related associate professionals
3144	Air traffic controllers
3145	Air traffic safety technicians

Source: Eurostat ISCO 88 (COM) Documentation

4.4.1 Percentage of the workforce

Figure 4.20 shows the proportion of the workforce working as ship and aircraft controllers and technicians. The UK with 0.14 per cent of the workforce has slightly more than the EU average of 0.11 per cent of the workforce. Interestingly, Norway (NO) has a significantly greater proportion of their workforce in these occupations at 0.6 per cent.

Figure 4.20: Ship and aircraft controllers and technicians as a percentage of the workforce, by country

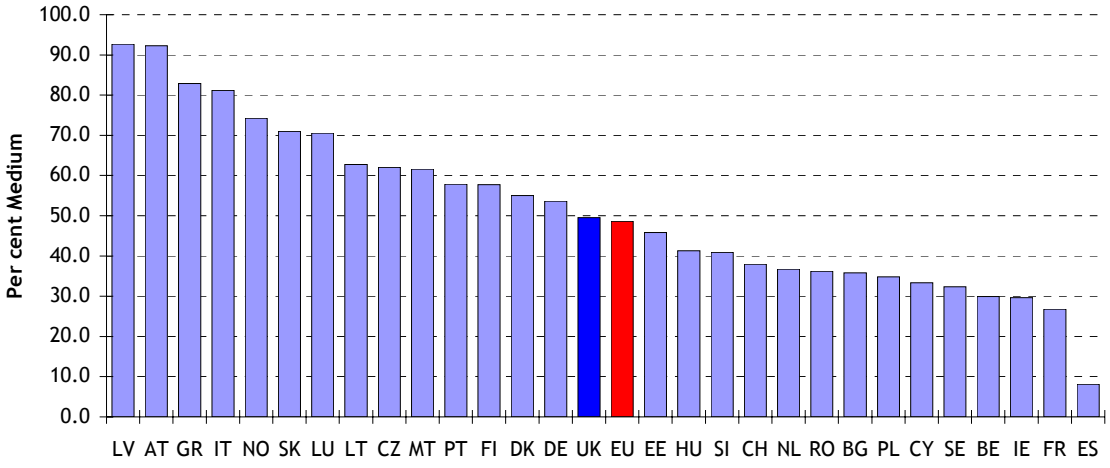


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.4.2 Percentage with intermediate level qualifications

Figure 4.21 shows that 49.9 per cent of the UK's ship and aircraft controllers and technicians were qualified at an intermediate level. This is almost the same proportion as the EU average which was 48.5 per cent. As before, the Eastern European countries were more likely to have this group of occupations qualified to intermediate levels. Likewise, the Mediterranean countries were less likely to have them qualified at this level.

Figure 4.21: Ship and aircraft controllers and technicians percentage with an intermediate level qualification

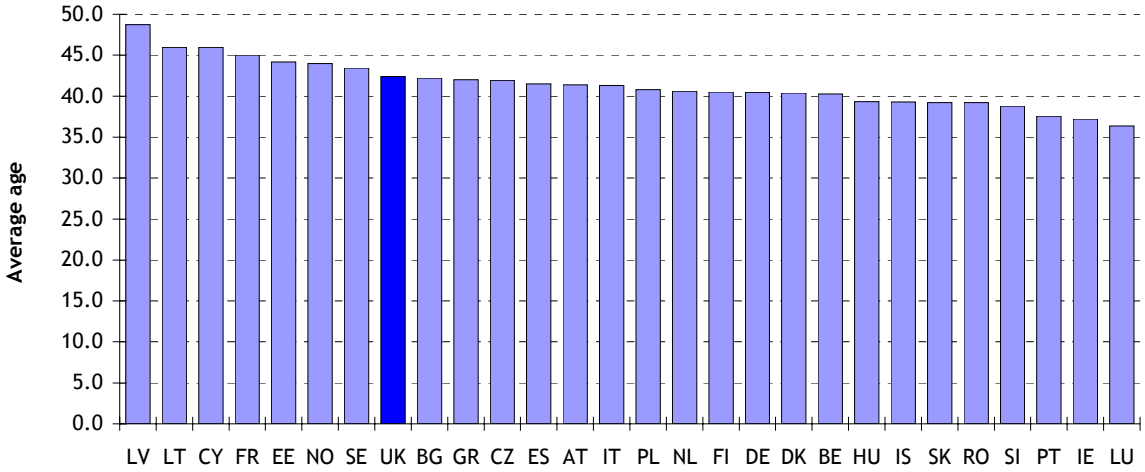


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.4.3 Average age

The average age of ship and aircraft controllers and technicians in the UK and elsewhere is shown in Figure 4.22. This indicates that in the UK this group is, on average, older than most other countries at 42.4 years old. This is less than in Latvia where the average was 48.7 years and more than Luxembourg (LU) where the average age was 36.3 years old.

Figure 4.22: Average age of ship and aircraft controllers and technicians

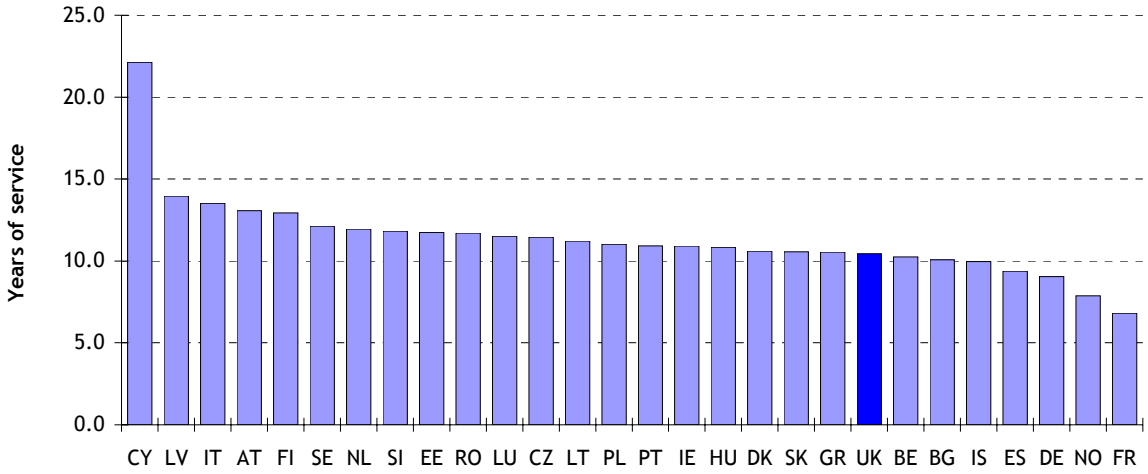


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.4.4 Length of service

In terms of length of service, there is an anomaly with Cyprus (CY) showing an average length of service of 22.1 years while all the other countries are within the range of 14 years for Latvia (LV) and seven years for France (FR). The UK fits nicely within this range with an average length of service of 10.4 years.

Figure 4.23: Length of service of ship and aircraft controllers and technicians

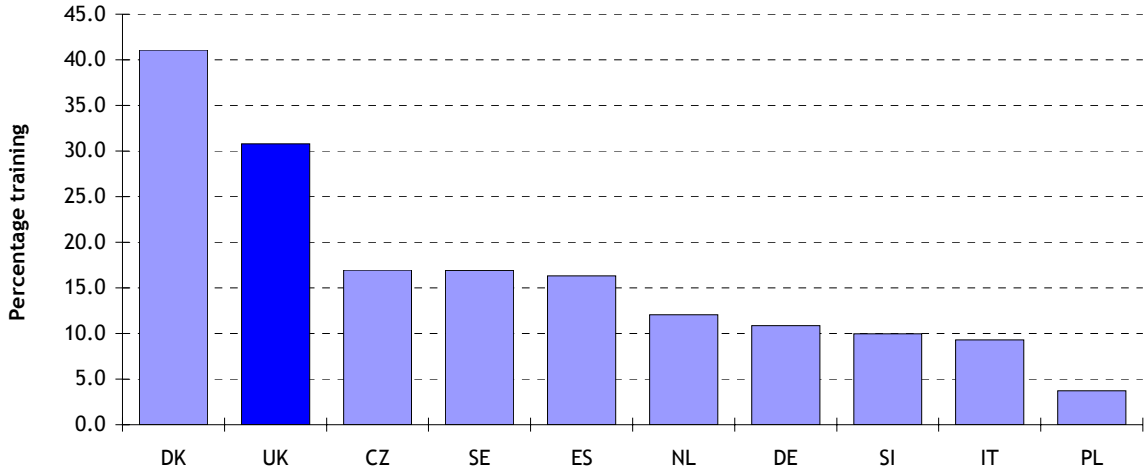


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.4.5 Percentage trained in last four weeks

Figure 4.24 shows the percentage of ship and aircraft controllers and technicians who had attended training in the previous four weeks. As before, the country pattern is largely determined by the national propensity to train. Of those in the UK, 30.8 per cent attended training which is a relatively high proportion, presumably reflecting the safety critical nature of the work of many in this group.

Figure 4.24: Percentage of ship and aircraft controllers and technicians trained in the last four weeks

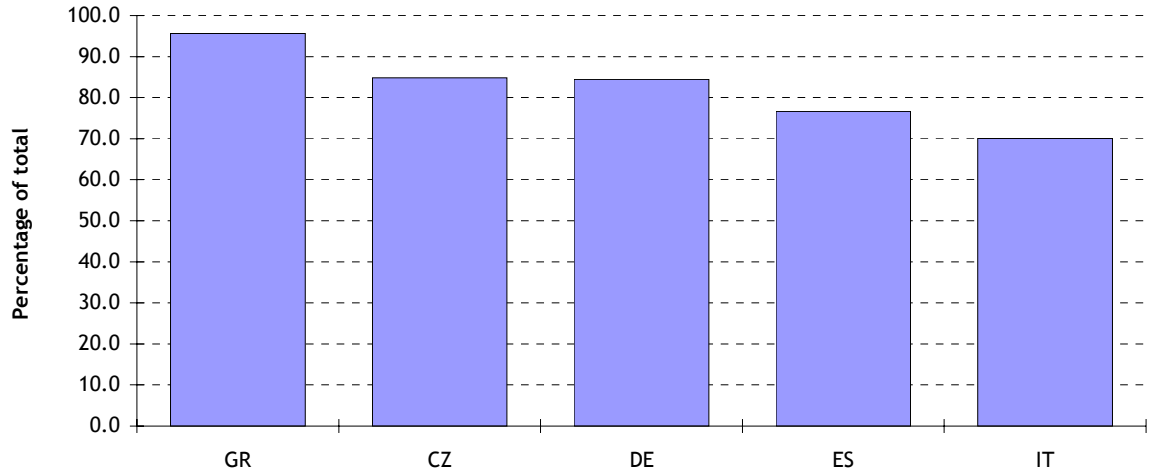


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.4.6 Sectors of employment

As might be expected, in many countries this group of employees were concentrated in the transportation and storage sector. This shows that for Greece (GR), the Czech Republic (CZ), Germany (DE), Spain (ES) and Italy 95.6, 84.8, 84.4, 76.6 and 70 per cent respectively were in this sector. Again there was a lack of sectoral specificity in the UK which meant that no single dominant sector could be identified for this group.

Figure 4.25: Percentage of ship and aircraft controllers and technicians in the transport and storage sector



Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.5 Safety and quality inspectors

The ISCO category 315 covers safety and quality inspectors. As before, Table 4.7, which shows the component four digit occupations, provides a better idea of the type of work undertaken by this group. Due to the underlying national occupational classification which is translated into ISCO there is no data from France covering safety and quality inspectors.

Table 4.7: ISCO components of safety and quality inspectors

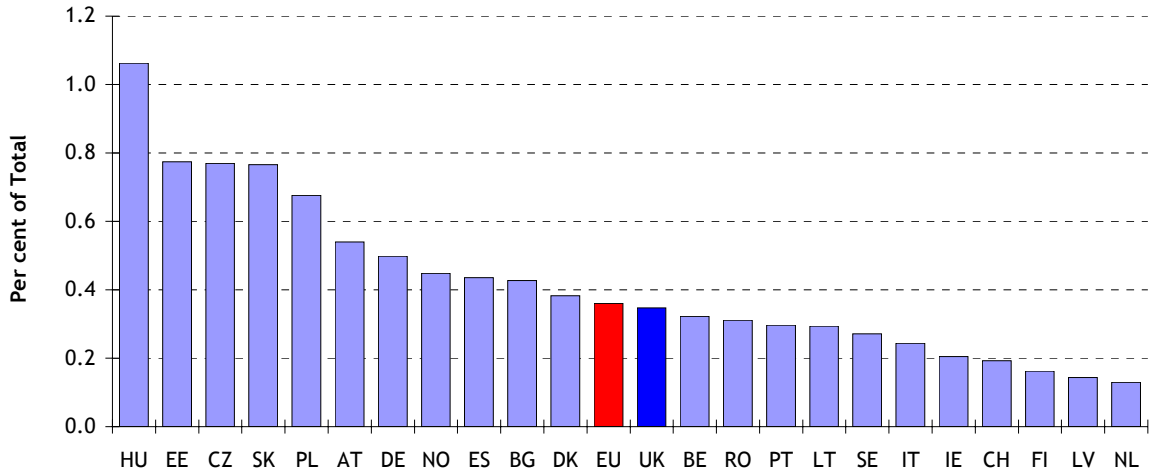
ISCO four digit codes	Description
3151	Building and fire inspectors
3152	Safety, health and quality inspectors

Source: Eurostat ISCO 88 (COM) Documentation

4.5.1 Percentage of the workforce

There is quite a variation in the proportion of the workforce employed as safety and quality inspectors. This ranges from 1.06 per cent in Hungary (HU) to 0.13 per cent in the Netherlands (NL), with the UK mid-range with 0.35 per cent of the workforce.

Figure 4.26: Safety and quality inspectors as a percentage of the workforce, by country

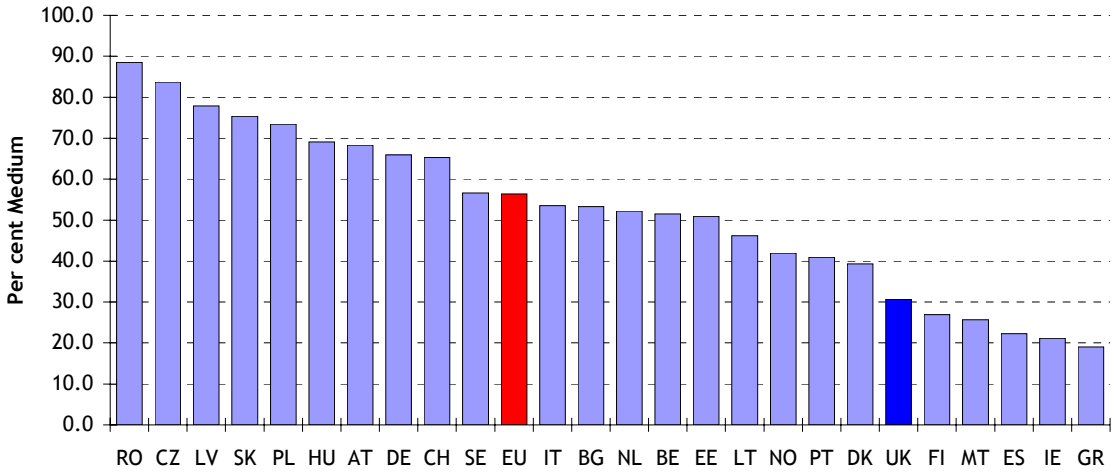


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.5.2 Percentage with intermediate level qualifications

The UK, as with most of the other SET technician occupations, has a smaller percentage of safety and quality inspectors qualified to intermediate levels. In the UK, 30.6 per cent have intermediate level qualifications. This compares with 56.4 for the EU overall and 88.5 per cent for Romania (RO).

Figure 4.27: Safety and quality inspectors, percentage with an intermediate level qualification

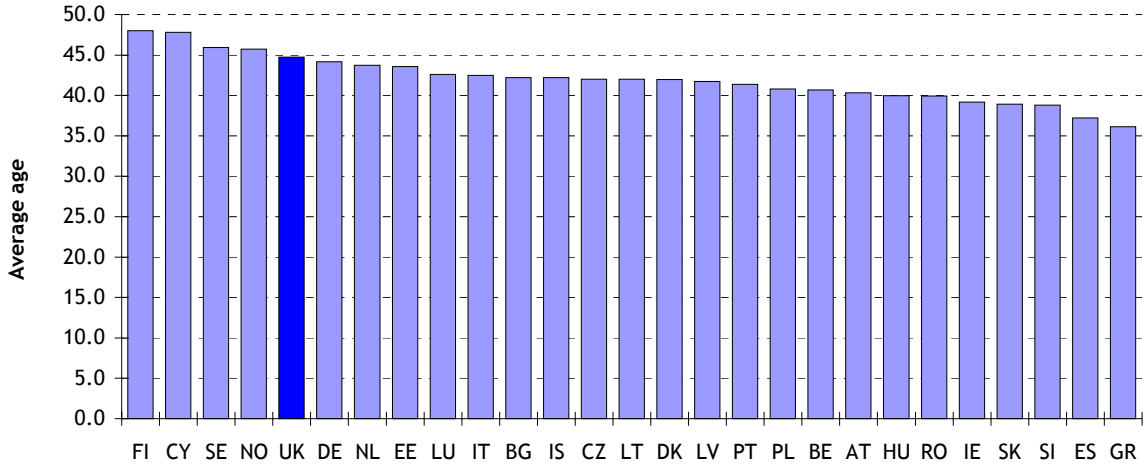


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.5.3 Average age

There is little variation in the average age of safety and quality inspectors; those in the UK were slightly older with an average age of 44.8 years.

Figure 4.28: Average age of safety and quality inspectors

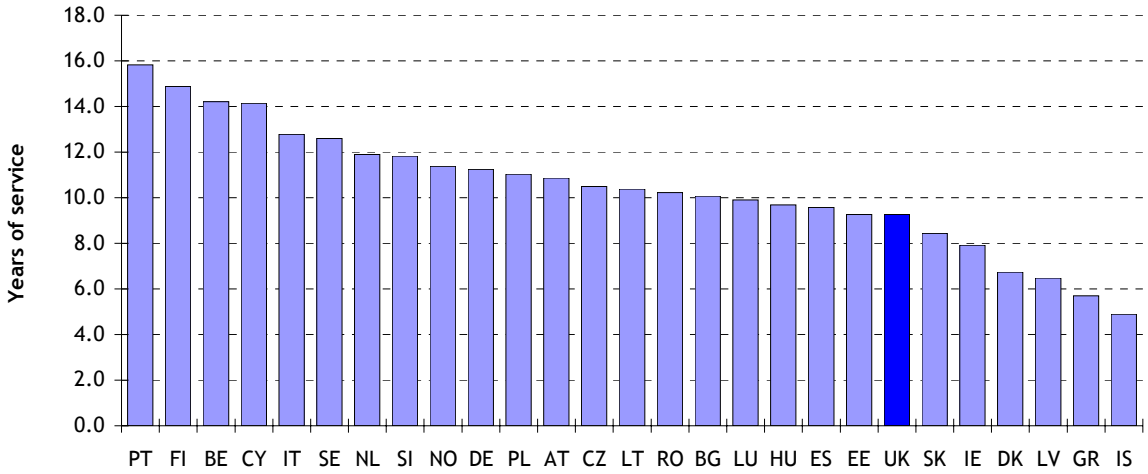


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.5.4 Length of service

As elsewhere, the average length of service of safety and quality inspectors in the UK is at the low end of the scale at 9.3 years. This compares with an average of 15.8 years in Portugal (PT) and 4.9 years in Iceland (IS).

Figure 4.29: Length of service of safety and quality inspectors

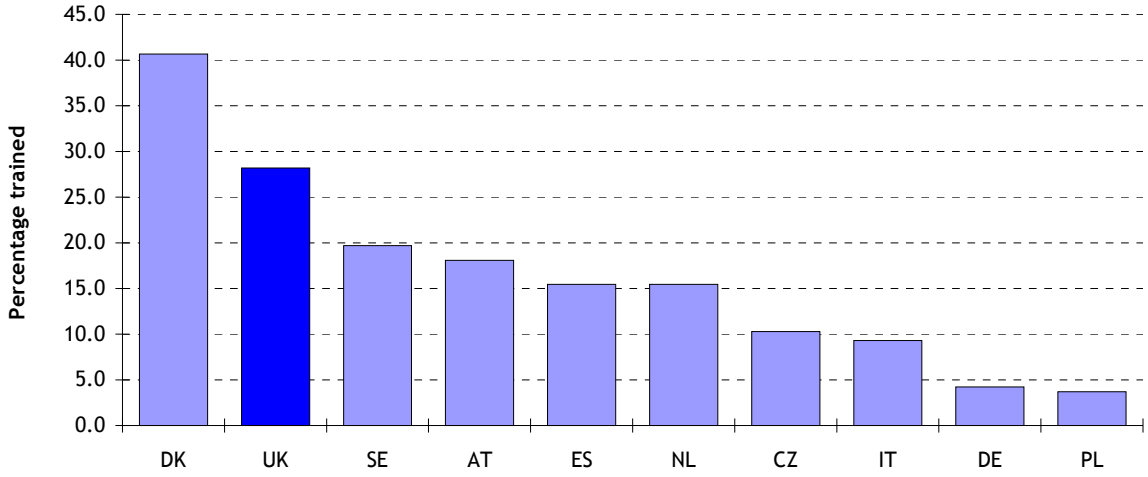


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.5.5 Percentage trained in the last four weeks

Again, as with the other SET technician occupations, the pattern of training received largely reflects the national proclivity to train. However, at 28.2 per cent the extent of training in the UK for safety and quality inspectors is greater than for the optical and electronic equipment operators and less than that received by the ship and aircraft controllers and technicians.

Figure 4.30: Percentage of safety and quality inspectors trained in the last four weeks

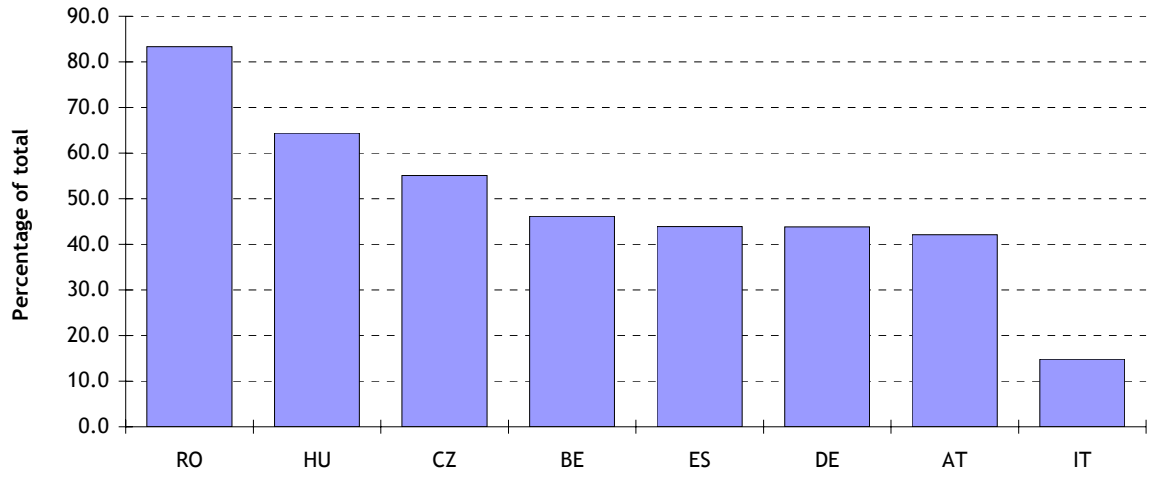


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.5.6 Sectors of employment

The most important single sector for safety and quality inspectors was manufacturing (SIC 2007 C). However, as with some of the other SET technician occupations in the UK, safety and quality inspectors are spread across a wide range of sectors and the numbers in manufacturing were too small to report. This means that Romania (RO) had the highest proportion (83.3 per cent) in manufacturing.

Figure 4.31: Percentage of safety and quality inspectors in manufacturing



Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.6 Life science technicians and related associate professionals

The ISCO category 321 covers life science technicians and related associate professionals. As before, a better idea of the type of work undertaken by this group can be obtained from Table 4.8 which provides details of the component four digit ISCO occupations. Due to the use in Ireland of a variant of the UK's SOC 1980 occupational classification as the underlying national occupational classification, there is no data covering life science technicians and related associate professionals.

Table 4.8: ISCO components of life science technicians and related associate professionals

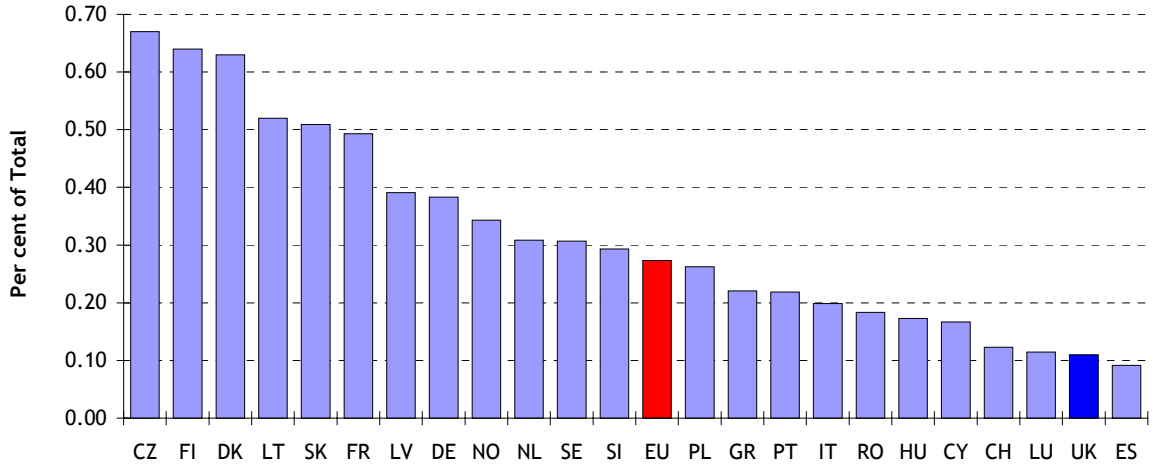
ISCO four digit codes	Description
3211	Life science technicians
3212	Agronomy and forestry technicians
3213	Farming and forestry advisers

Source: Eurostat ISCO 88 (COM) Documentation

4.6.1 Percentage of the workforce

The UK has one of the smallest proportions of the workforce in these life science technician type occupations at 0.11 per cent of the workforce, compared with an EU average of 0.27 per cent of the workforce. The Czech Republic has the highest proportion of these life science technician occupations at 0.67 per cent of the workforce.

Figure 4.32: Life science technicians and related associate professionals as a percentage of the workforce, by country

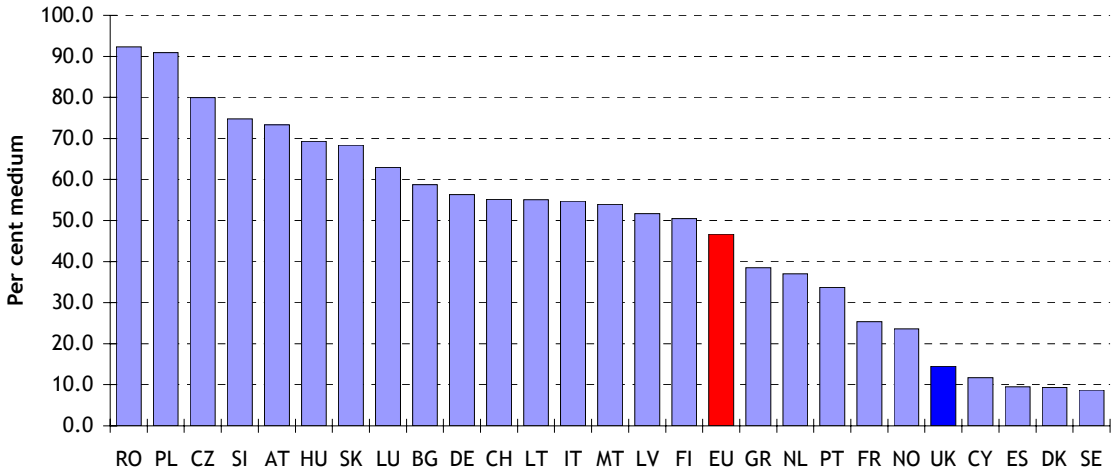


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.6.2 Percentage with intermediate level qualifications

As with the other SET technician ISCO occupations, the UK had a low proportion of life science technicians qualified to an intermediate level. The UK had 14.5 per cent with intermediate level qualifications and this compares with Romania (RO) where 92.3 per cent had this level of qualification. The UK figure also compares with the EU average value of 46.7 per cent.

Figure 4.33: Life science technicians and related associate professionals percentage with an intermediate level education, by country

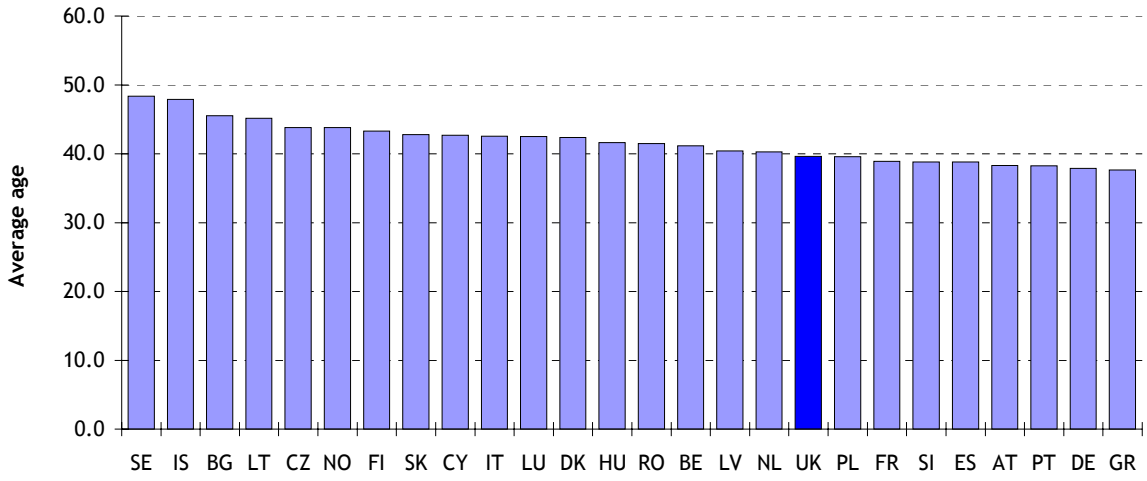


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.6.3 Average age

The average age of UK life science technicians was 39.6 years old and this compares to a more problematic age of 60.2 in Estonia (EE) and more general problems in the Scandinavian countries where the average is above 43 in all cases.

Figure 4.34: Average age of life science technicians and related associate professionals



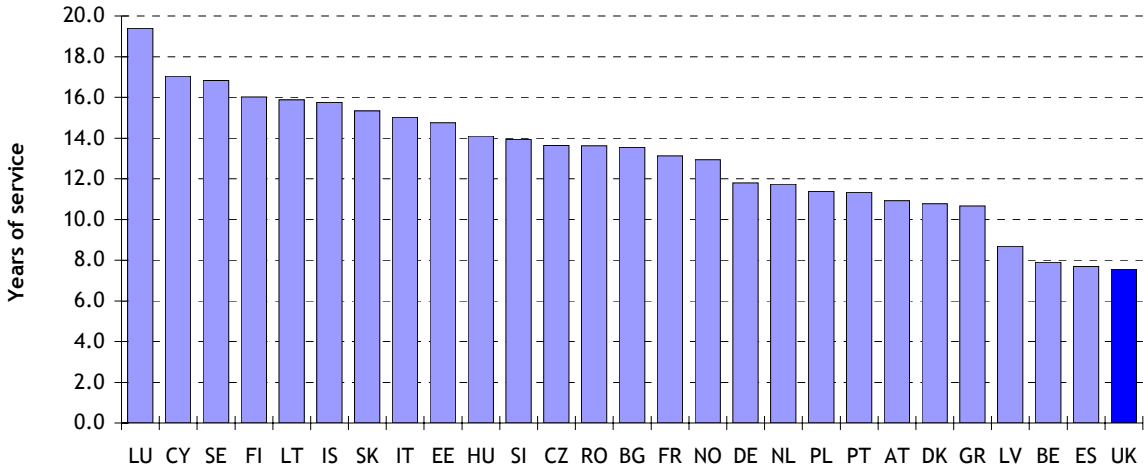
Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.6.4 Length of service

The UK has the shortest average length of service for life science technicians of all the countries covered. Six countries have more than twice the UK's average length

of service of 7.6 years. These countries are Luxembourg (LU), Cyprus (CY), Sweden (SE), Finland (FI), Lithuania (LT) and Iceland (IS) that had average lengths of service of 19.4, 17.0, 16.8, 16.0, 15.9, and 15.7 years respectively.

Figure 4.35: Length of service of life science technicians and related associate professionals

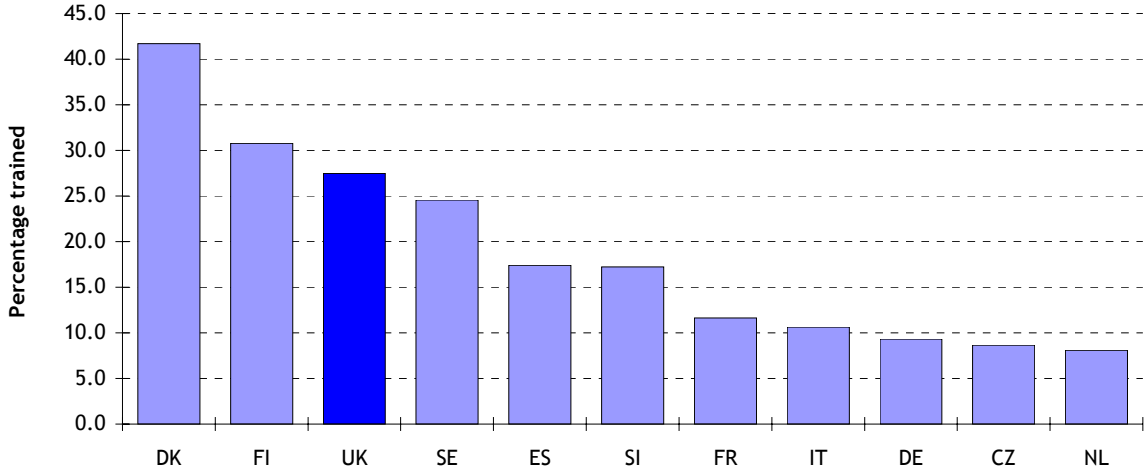


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.6.5 Percentage trained in the last four weeks

As with the other SET technician occupations, the extent of training amongst the life science technicians largely is driven by the national pattern of training. However, where we have data, more life science technicians attended training than any of the other SET technician ISCO occupational groups.

Figure 4.36: Percentage of life science technicians and associate professionals trained in the last four weeks

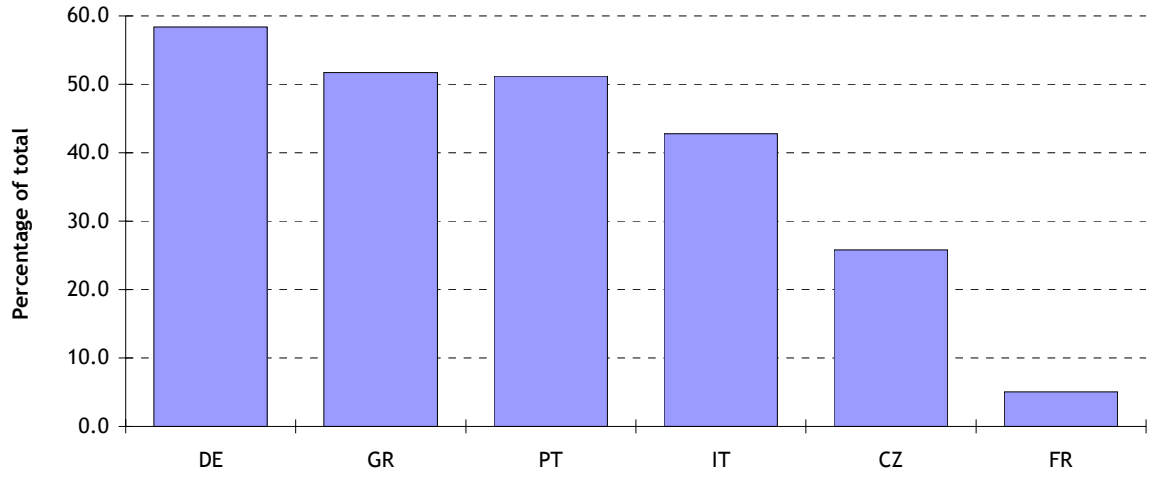


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.6.6 Sectors of employment

Generally, it is assumed that the most important sector for the employment of life science technicians and associate professionals is the human health and social work sector or SIC 2007 Q.

Figure 4.37: Percentage of life science technicians and associate professionals in the human health and social work activities sector



Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

Again, the UK life science technicians are spread across many sectors and the numbers actually in the human health sector are too small to report. Germany (DE) has the highest concentration in this sector with 58.4 per cent located there.

4.7 Health associate professions (except nursing)

The ISCO category 322 covers health associate professions (except nursing). As before, the coverage is best described by looking at the component four digit occupations and their descriptions in Table 4.9.

Table 4.9: ISCO components of health associate professions (except nursing)

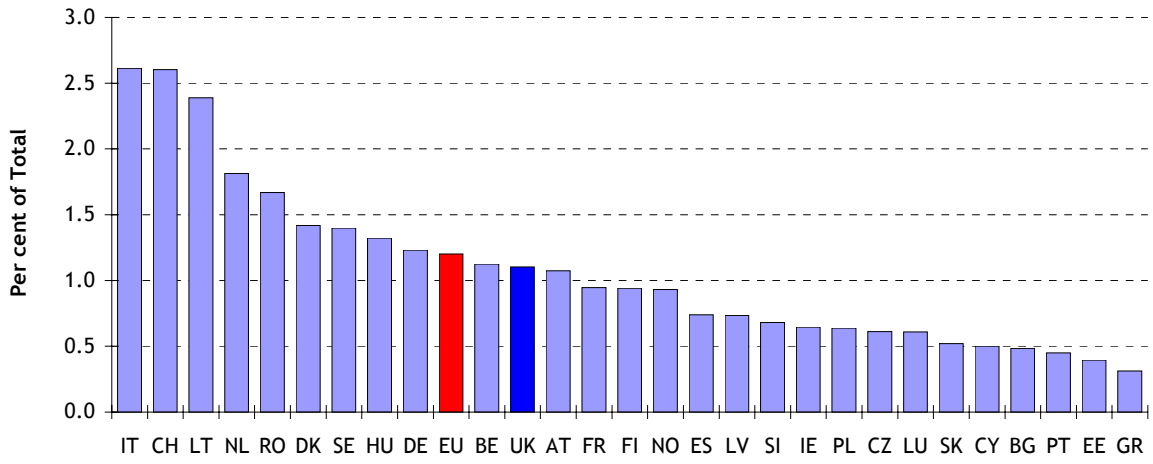
ISCO four digit codes	Description
3221	Medical assistants
3222	Hygienists, health and environmental officers
3223	Dieticians and nutritionists
3224	Optometrists and opticians
3225	Dental assistants
3226	Physiotherapists and related associate professionals
3227	Veterinary assistants
3228	Pharmaceutical assistants
3229	Health associate professionals (except nursing) not elsewhere classified

Source: Eurostat ISCO 88 (COM) Documentation

4.7.1 Percentage of the workforce

As shown in Figure 4.38, the UK has slightly fewer health associate professionals than the EU average in terms of percentage of the workforce. Italy has the highest concentration of these health associate professionals with 2.61 per cent of the workforce. This compares with the UK with 1.10 per cent and Greece (GR) with 0.31 per cent of the workforce.

Figure 4.38: Health associate professions (except nursing) as a percentage of the workforce, by country

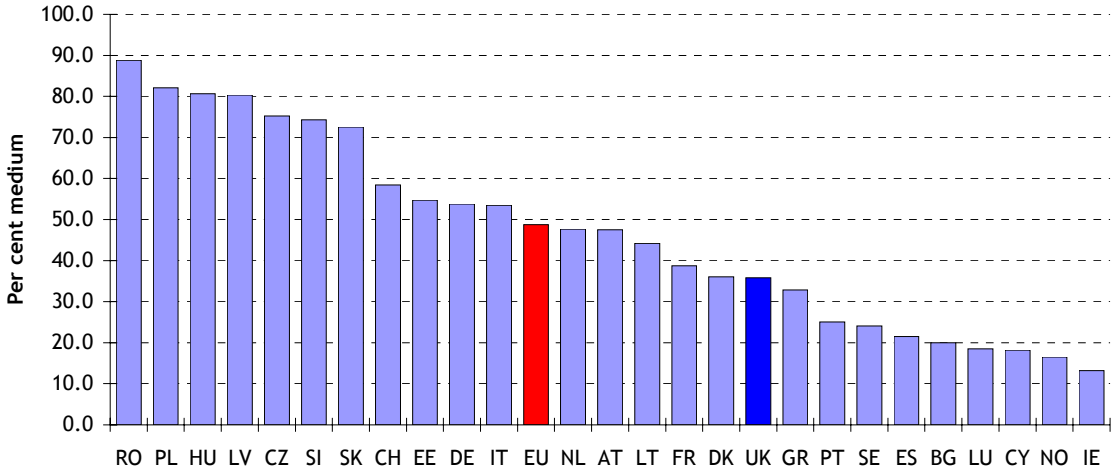


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.7.2 Percentage with intermediate level qualifications

The proportion of the health associate professions with an intermediate level qualification in the UK at 35.8 per cent of the workforce is less than the EU average and at the lower end of the European spectrum. The accession states from Eastern Europe had the highest proportions with intermediate level qualifications with Romania (RO) with 88.8 per cent with intermediate qualifications.

Figure 4.39: Health associate professions (except nursing) percentage with an intermediate level education

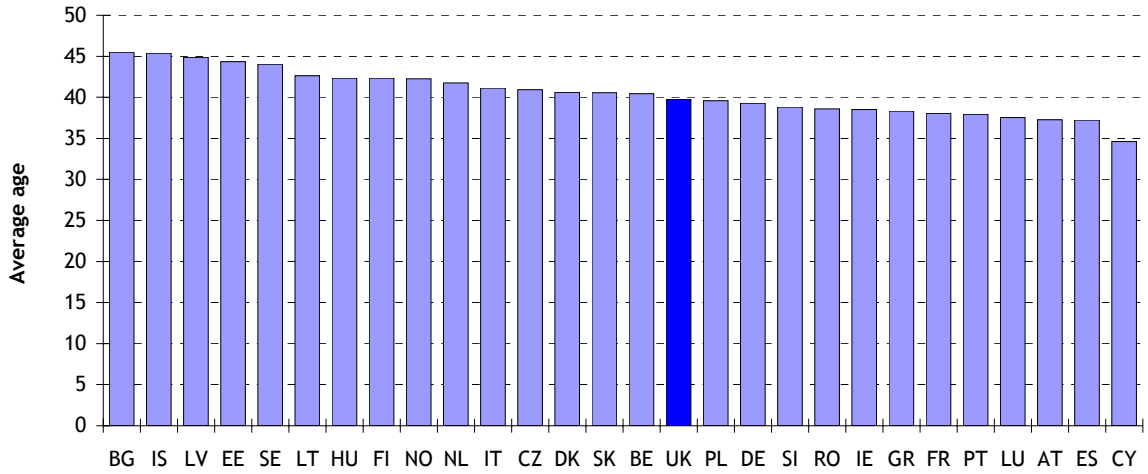


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.7.3 Average age

The average age of UK health associate professionals was 39.7 years. This compares with 45.5 years in Bulgaria (BG) and 34.6 years in Cyprus (CY).

Figure 4.40: Average age of health associate professionals (except nursing)

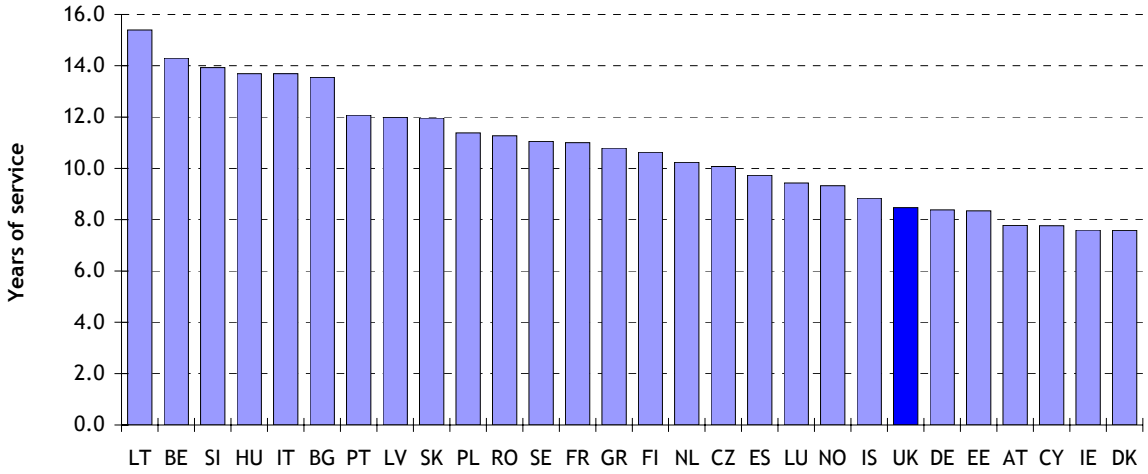


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.7.4 Length of service

The UK's average length of service of 8.5 years is at the low end of the spectrum and compares with an average length of service in Lithuania of 15.4 years.

Figure 4.41: Length of service of health associate professionals (except nursing)

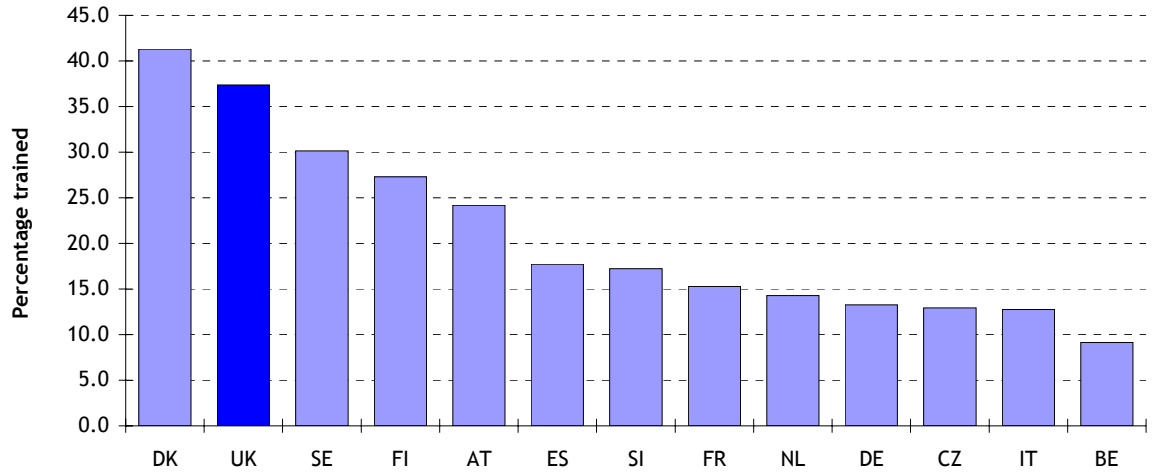


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.7.5 Percentage trained in the last four weeks

Given the nature of the occupation and the generally higher levels of ongoing training associated with health associate professional occupations, more countries are shown in Figure 4.42. This shows that, as elsewhere, Denmark (DK) and the UK had the highest incidence of training at 41.3 and 37.3 per cent respectively.

Figure 4.42: Percentage of health associate professionals (except nursing) trained in the last four weeks

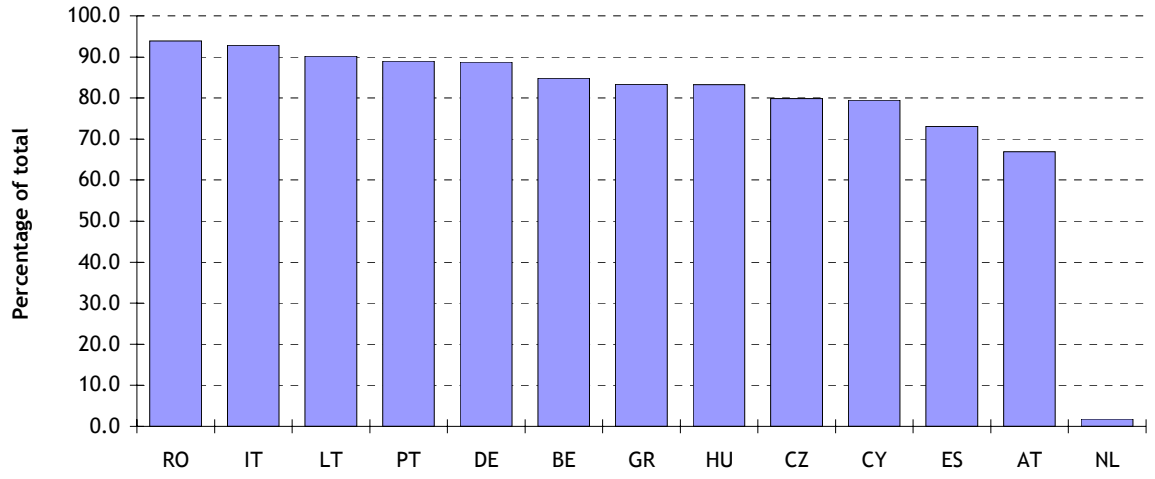


Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

4.7.6 Sectors of employment

Overall, and perhaps surprisingly, the human health and social work sector was often not the main sector employing health associate professionals. Therefore, the analysis examined their employment in the wholesale and retail trade, repair of motor vehicles and motorcycles as well as the human health and social work activities sector. The results of this analysis are presented in Figure 4.43. This shows that for 12 countries this combination of sectors accounts for more than 65 per cent of the health associate professionals. Again in the UK, these SET technicians are spread over too many sectors to allow a reliable analysis.

Figure 4.43: Percentage of health associate professionals (except nursing) in wholesale and retail trade, repair of motor vehicles and motorcycles as well as human health and social work activities



Source: Eurostat 2008 Annual Average Analysis of the European Labour Force Survey

5 National Analyses

This analysis at the national level includes some other countries than in the preceding chapter as this chapter uses tables generated by Eurostat and vetted to ensure confidentiality. By contrast, the bulk of the data in the preceding chapter is derived from confidential micro-data obtained by IES and analysed under strict conditions. However, there are a reduced number of countries that allow their micro-data to be analysed in this way.

However, before moving on to a country by country analysis, a further cross-country analysis is presented. Table 5.1 shows data covering 2008:

- SET technicians as a percentage of the workforce – this shows the importance of SET technicians within the national economy.
- SET technicians as a percentage of manufacturing and energy employment – this shows the contribution of SET technicians to the manufacturing and energy sectors.
- Industrial gross value added as a percentage of total gross value added – this shows the contribution of manufacturing and the energy sectors to the overall economy.
- Gross domestic product (GDP) per capita – this is expressed as a proportion of the total EU27 GDP per capita and therefore shows the country's relative output per head of population.

Overall, this table shows that there is no clear, or straightforward, relationship between the numbers or distribution of SET technicians and industrial output or national output. However, the data is suggestive of a linkage, and with potentially a larger range of variables and the use of multivariate analysis techniques, the complex story could possibly be derived.

Table 5.1: Summary SET technician and economic performance indicators

	SET Technicians as % of Workforce	% Manufacturing Employment SET Technicians	Industrial Gross Value added as % Total GDP	GDP per capita in PPP (EU27 = 100)
Austria	6.5	10.5	23.2	123.5
Belgium	6.8	14.0	17.9	115.2
Bulgaria	3.8	14.0	21.9	41.3
Switzerland	6.9	na	22.6	140.8
Cyprus	2.8	1.3	10.2	95.9
Czech Republic	8.7	11.2	31.0	80.4
Germany	6.2	8.6	25.6	115.6
Denmark	6.7	10.9	20.2	120.1
Estonia	2.8	2.9	20.9	67.4
Spain	3.4	5.3	17.0	102.6
European Union	5.3	na	20.1	100.0
Finland	5.1	6.9	25.1	116.9
France	6.0	11.7	13.8	108.0
Greece	2.9	3.5	14.2	94.3
Hungary	4.9	6.7	24.5	64.4
Ireland	2.3	4.8	23.9	135.4
Italy	8.2	9.2	20.8	101.8
Lithuania	4.3	2.8	21.5	61.9
Luxembourg	3.4	5.0	9.9	276.4
Latvia	4.3	4.7	13.7	57.3
Malta	5.9	n.a.	17.4	76.0
Netherlands	6.2	5.0	19.7	134.0
Norway	7.0	10.9	41.2	191.2
Poland	3.7	0.1	24.4	56.4
Portugal	3.3	2.8	17.5	76.0
Romania	4.1	4.5	25.7	41.6
Sweden	6.7	10.1	22.1	122.3
Slovenia	6.1	0.6	25.5	90.9
Slovakia	6.4	9.7	29.7	72.3
United Kingdom	3.7	3.5	17.6	116.2

Notes: n.a. =not available, Romania GDP per capita data for 2007 all other data 2008.

Sources: SET technicians as % workforce special extract obtained from Eurostat; manufacturing employment % SET technicians IES analysis of ELFS micro-data; value added and GDP per capita data from Eurostat structural indicators

Table 5.2 provides a key to the symbols used in the following national tables. These symbols show the relative position of the occupation in each country compared with the EU norm. Where appropriate the actual value appears below the symbol.

Table 5.2: Key to the symbols used in the national tables

Symbol	Description
+ value	More than the EU average
== value	Almost equal to the EU average
- value	Less than the EU average
* *	Too small cell sizes for reporting
n.a.	Not available

Source: IES

5.1 Austria

Austria (AT) has data from the special compilation and from the micro-data analysis. Austria has a total of about 259,000 SET technicians which represents 6.5 per cent of the Austrian workforce. This compares with an average value of 5.3 per cent of the workforce for the whole of the EU. The data shows that virtually all (92.3 per cent) of the ship and aircraft controllers and technicians had an intermediate level qualification in Austria. The Austrian health associate technicians and related associate professionals had the least (47.5 per cent) qualified to an intermediate level and the most (46.0 per cent) qualified to a high level. The classification of attainment into low, intermediate and high and the linkage to UK qualifications is outlined in Table 4.3.

Table 5.3 summarises Austria's relative position compared with the EU average, using the symbols shown in Table 5.2.

Table 5.3: Features of Austrian SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	= = 38.3	+ 12.8	+ 76.7	+ 3.6
312 Computer associate professionals	= = 35.9	+ 13.0	+ 74.7	+ 0.8
313 Optical and electronic equipment operators	= = 38.4	* *	+ 59.5	= = 0.3
314 Ship and aircraft controllers and technicians	= = 41.4	* *	+ 92.3	= = 0.1
315 Safety and quality inspectors	= = 40.3	+ 18.1	+ 68.3	= = 0.5
321 Life science technicians and related associate professionals	* *	* *	+ 73.3	* *
322 Health associate professionals (except nursing)	= = 37.3	+ 24.2	= = 47.5	= = 1.1

Source: Analysis of the Annual 2008 European Labour Force

5.2 Belgium

Belgium (BE) has data from the special compilation and from the micro-data analysis. In Belgium, there was a total of about 299,000 SET technicians which represents 6.8 per cent of the Belgian workforce. This is more than the average value for the EU which is 5.3 per cent of the workforce. The data shows that in Belgium SET technicians tend to have a mixture of intermediate and high level qualifications. The health associate professionals were the most likely to have a high level qualification at 84.4 per cent of the total. The optical and electronic equipment operators were also more likely (at 69.4 per cent) to have a high level qualification.

Table 5.4 provides summary information on the relative position of Belgium compared with the EU average.

Table 5.4: Features of Belgian SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	= = 40.4	= = 6.9	- 48.5	+ 4.8
312 Computer associate professionals	= = 35.3	* *	= = 52.8	- 0.1
313 Optical and electronic equipment operators	= = 37.9	* *	- 25.9	- 0.2
314 Ship and aircraft controllers and technicians	= = 40.3	* *	- 29.9	= = 0.1
315 Safety and quality inspectors	- 40.7	* *	= = 51.5	= = 0.3
321 Life science technicians and related associate professionals	* *	* *	* *	* *
322 Health associate professionals (except nursing)	= = 40.4	+ 9.1	* *	= = 1.1

Source: Analysis of the Annual 2008 European Labour Force

5.3 Bulgaria

Bulgaria (BG) has a total of about 126,000 SET technicians which represents 3.8 per cent of the Bulgarian workforce. This is less than the EU average value of 5.3 per cent of the workforce. The data shows that, apart from health associate professionals (except nursing) of whom 79.2 per cent were qualified to a high level, the bulk of the Bulgarian SET technicians were qualified to an intermediate level. This was particularly the case for the largest SET technician group which was physical and engineering science technicians which had 78.4 per cent qualified at an intermediate level.

Table 5.5 provides summary information on the relative position of the Bulgarian SET technicians compared with the EU average.

Table 5.5: Features of Bulgarian SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	= = 42.2	* *	+ 78.4	= = 2.0
312 Computer associate professionals	+ 42.2	* *	+ 61.0	- 0.4
313 Optical and electronic equipment operators	+ 42.2	* *	+ 70.4	- 0.2
314 Ship and aircraft controllers and technicians	= = 42.2	* *	- 35.8	+ 0.2
315 Safety and quality inspectors	= = 42.2	* *	= = 53.3	= = 0.4
321 Life science technicians and related associate professionals	* *	* *	* *	* *
322 Health associate professionals (except nursing)	= = 45.5	* *	- 20.0	- 0.5

Source: Analysis of the Annual 2008 European Labour Force

5.4 Switzerland

Switzerland (CH) has a total of about 284,000 SET technicians which represents 6.9 per cent of the Swiss workforce. This is more than the average EU value where 5.3 per cent of the workforce are SET technicians. The available data shows that in Switzerland, ship and aircraft controllers and technicians have the highest educational profile with 58.6 per cent with high level qualifications. By comparison, 68.4 per cent of the Swiss computer associate professionals had intermediate level qualifications. The only data available covering Switzerland is that relating to the numbers and qualification levels of SET technicians as Swiss data is not contained in the Eurostat LFS micro-data release.

5.5 Cyprus

Cyprus (CY) has a total of about 11,000 SET technicians which represents 2.8 per cent of the Cypriot workforce. This is a significantly smaller proportion of the workforce than the EU average of 5.3 per cent. The data shows that in Cyprus, where there were sufficient numbers to report, a significant proportion of SET technicians had high level qualifications. However, the low proportions of the workforce in these occupations suggest that this is more of an absence of intermediate level qualified personnel than an highly qualified profile.
Table 5.6 shows the relative position of the SET technicians in Cyprus.

Table 5.6: Features of Cypriot SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	+ 42.5	* *	- 27.0	- 1.3
312 Computer associate professionals	= = 34.8	* *	- 22.8	- 0.3
313 Optical and electronic equipment operators	= = 36.1	* *	- 43.4	+ 0.4
314 Ship and aircraft controllers and technicians	* *	* *	* *	* *
315 Safety and quality inspectors	* *	* *	* *	* *
321 Life science technicians and related associate professionals	= = 42.7	* *	- 11.7	- 0.2
322 Health associate professionals (except nursing)	- 34.6	* *	- 18.2	- 0.5

Source: Analysis of the Annual 2008 European Labour Force

5.6 Czech Republic

The Czech Republic (CZ) has a total of about 430,000 SET technicians which represents 8.7 per cent of the Czech workforce. This is a significantly greater proportion of the Czech workforce than the EU average value of 5.3 per cent. The data shows that the majority of SET technicians in the Czech Republic are qualified at an intermediate level. This is most pronounced amongst the physical and engineering science technicians, of whom 85 per cent were qualified to an intermediate level. It is also clear that very few of the Czech SET technicians are qualified at a low level as the combination of intermediate and high level qualifications account for almost all of the SET technicians. The group with the highest proportion of high level qualifications (38 per cent) were the ship and aircraft controllers and technicians.

Table 5.7 shows the relative position of Czech SET technicians compared with the EU average.

Table 5.7: Features of Czech SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	= = 41.9	= = 8.6	+ 85.0	+ 5.0
312 Computer associate professionals	= = 34.5	+ 11.6	+ 74.6	+ 1.2
313 Optical and electronic equipment operators	= = 38.3	= = 9.8	+ 80.6	+ 0.4
314 Ship and aircraft controllers and technicians	= = 41.9	+ 16.9	+ 62.0	- 0.1
315 Safety and quality inspectors	= = 42.0	+ 10.3	+ 83.7	+ 0.8
321 Life science technicians and related associate professionals	= = 43.8	= = 8.6	+ 79.9	+ 0.7
322 Health associate professionals (except nursing)	= = 40.9	+ 12.9	+ 75.2	- 0.6

Source: Analysis of the Annual 2008 European Labour Force

5.7 Germany

Germany (DE) has a total of about 2,379,000 SET technicians which represents 6.2 per cent of the German workforce. This is more than the EU average density of SET technicians which is 5.3 per cent of the EU workforce. The data shows that while intermediate level qualifications are important for SET technicians in Germany, there is also a substantial proportion with higher level qualifications. The highest proportion with intermediate level qualifications was the safety and quality inspectors and the highest proportion with high level qualifications was the computer associate professionals.

Table 5.8 shows the relative position of German SET technicians compared with the EU average.

Table 5.8: Features of German SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	= = 42.4	= = 6.1	= = 57.9	+ 3.0
312 Computer associate professionals	+ 39.7	= = 8.3	= = 48.7	= = 0.8
313 Optical and electronic equipment operators	+ 39.4	= = 5.8	+ 59.9	- 0.2
314 Ship and aircraft controllers and technicians	= = 40.5	+ 10.9	+ 53.6	= = 0.1
315 Safety and quality inspectors	= = 44.1	= = 4.2	+ 65.9	+ 0.5
321 Life science technicians and related associate professionals	= = 37.9	= = 9.3	+ 56.3	+ 0.4
322 Health associate professionals (except nursing)	= = 39.3	+ 13.3	+ 53.8	= = 1.2

Source: Analysis of the Annual 2008 European Labour Force

5.8 Denmark

Denmark (DK) has a total of about 188,000 SET technicians which represents 6.7 per cent of the Danish workforce. This is more than the EU average of 5.3 per cent of the workforce. The data shows that in Denmark some SET technician occupations were predominately staffed with those with high level qualifications, while others were mainly staffed by those with intermediate level qualifications. The Danish life science technicians and related associate professionals were 85.2 per cent high level qualified as were 55.7 per cent of the health associate professionals. This compares with the optical and electronic equipment operators where 57.4 per cent had intermediate level qualifications.

Table 5.9 shows the relative position of Danish SET technicians compared with the EU average.

Table 5.9: Features of Danish SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	= = 42.0	+ 27.7	= = 55.3	+ 2.9
312 Computer associate professionals	= = 37.8	= = 27.5	= = 54.2	= = 0.8
313 Optical and electronic equipment operators	= = 37.8	* *	= = 57.4	+ 0.3
314 Ship and aircraft controllers and technicians	= = 40.4	+ 41.1	= = 55.0	+ 0.3
315 Safety and quality inspectors	= = 42.0	+ 40.7	- 39.3	= = 0.4
321 Life science technicians and related associate professionals	= = 42.4	+ 41.7	- 9.3	+ 0.6
322 Health associate professionals (except nursing)	= = 40.6	+ 41.3	= = 36.0	= = 1.4

Source: Analysis of the Annual 2008 European Labour Force

5.9 Estonia

Estonia (EE) has a total of about 18,000 SET technicians which represents 2.8 per cent of the Estonian workforce. This is significantly less than the EU average of 5.3 per cent of the workforce. The data shows that where the data is reliable that there are more SET technicians with intermediate level qualifications than high level qualifications. Just over 40 per cent of the physical and engineering science technicians have a high level qualification and this compares with 45.6 per cent for safety and quality inspectors.

Table 5.10 shows the relative position of Estonian SET technicians.

Table 5.10: Features of Estonian SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	+ 44.3	* *	= = 58.0	- 0.8
312 Computer associate professionals	* *	* *	* *	* *
313 Optical and electronic equipment operators	+ 45.5	* *	+ 62.1	= = 0.3
314 Ship and aircraft controllers and technicians	= = 44.1	* *	= = 45.8	+ 0.4
315 Safety and quality inspectors	= = 43.6	* *	- 50.9	+ 0.8
321 Life science technicians and related associate professionals	* *	* *	* *	* *
322 Health associate professionals (except nursing)	= =	* *	= = 54.7	- 0.4

Source: Analysis of the Annual 2008 European Labour Force

5.10 Spain

Spain (ES) has a total of about 688,000 SET technicians which represents 3.4 per cent of the Spanish workforce. This is less than the EU average value of 5.3 per cent of the workforce. The data shows that across the board in Spain the SET technicians are more likely than in other countries to have high level qualifications. This means that 86.4 per cent of ship and aircraft controllers and technicians have a high level qualification. By comparison, of the computer associate professionals, 28.1 per cent have intermediate level qualifications, which is the highest reportable incidence of this level of qualifications.

Table 5.11 shows the position of Spanish SET technicians compared with the EU average.

Table 5.11: Features of Spanish SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	- 37.3	= = 11.3	- 18.0	- 0.9
312 Computer associate professionals	- 33.8	+ 19.2	- 28.1	= = 0.9
313 Optical and electronic equipment operators	= = 35.9	+ 13.2	- 21.3	= = 0.3
314 Ship and aircraft controllers and technicians	= = 41.5	+ 16.3	- 8.1	= = 0.1
315 Safety and quality inspectors	- 37.2	+ 15.4	- 22.3	= = 0.4
321 Life science technicians and related associate professionals	= = 38.8	+ 17.4	- 9.5	- 0.1
322 Health associate professionals (except nursing)	- 37.2	+ 17.7	- 21.5	- 0.7

Source: Analysis of the Annual 2008 European Labour Force

5.11 Finland

Finland (FI) has a total of 126,000 SET technicians which represents 5.1 per cent of the Finish workforce. This is slightly less than the EU average value of 5.3 per cent of the workforce. The data shows that in Finland, apart from health associate professionals, relatively high proportions of the workforce have intermediate level qualifications. The highest proportion with intermediate level qualifications was the optical and electronic equipment operators where 63.1 per cent had that level of qualification. By comparison, 88 per cent of the health associate professionals had high level qualifications.

Table 5.12 shows the relative position of Finnish SET technicians.

Table 5.12: Features of Finnish SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	+ 44.2	+ 20.3	- 44.0	= = 2.4
312 Computer associate professionals	= = 36.3	+ 27.7	+ 54.2	- 0.5
313 Optical and electronic equipment operators	= = 36.9	* *	+ 63.1	- 0.2
314 Ship and aircraft controllers and technicians	= = 40.5	* *	+ 57.7	+ 0.2
315 Safety and quality inspectors	+ 48.0	* *	- 26.9	= = 0.2
321 Life science technicians and related associate professionals	= = 43.	+ 30.7	= = 50.5	+ 0.6
322 Health associate professionals (except nursing)	= = 42.3	+ 27.3	+ 10.9	= = 0.9

Source: Analysis of the Annual 2008 European Labour Force

5.12 France

France (FR) has a total of about 1,543,000 SET technicians which represents 6.0 per cent of the French workforce. This is a greater proportion of the workforce than the EU average of 5.3 per cent. The data shows that in France there was a slight tendency for SET technicians to be more likely to have a high level qualification rather than an intermediate level qualification. This meant that 69.1 per cent of the ship and aircraft controllers and technicians had a high level qualification. By comparison, 51 per cent of the French physical and engineering science technicians had an intermediate level qualification.

Table 5.13 provides information on the relative position of French SET technicians compared with the EU average.

Table 5.13: Features of French SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	- 39.2	= = 11.1	- 51.0	+ 3.7
312 Computer associate professionals	= = 35.5	= = 6.1	- 35.4	- 0.6
313 Optical and electronic equipment operators	= = 37.9	* *	- 40.0	- 0.2
314 Ship and aircraft controllers and technicians	= = 45.0	* *	- 26.8	- 0.0
315 Safety and quality inspectors	n.a.	n.a.	n.a.	n.a.
321 Life science technicians and related associate professionals	= = 38.9	= = 11.6	- 25.4	+ 0.5
322 Health associate professionals (except nursing)	= = 38.1	+ 15.3	= = 38.7	= = 0.9

Source: Analysis of the Annual 2008 European Labour Force

5.13 Greece

Greece (GR) has a total of about 130,000 SET technicians which represents 2.9 per cent of the Greek workforce. This is significantly less than the EU average value of 5.3 per cent of the workforce. The data shows that some component SET technician occupations were more likely to have intermediate level qualifications than on average, while others were more likely to have high level qualifications than on average. The ship and aircraft controllers and technicians were more likely (82.9 per cent) than usual to have an intermediate level qualification. By comparison, 63.9 per cent of the Greek health associate professionals had a high level qualification.

Table 5.14 indicates the relative position of Greek SET technicians compared with the EU average.

Table 5.14: Features of Greek SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	= = 40.1	* *	= = 47.8	= = 1.4
312 Computer associate professionals	- 34.3	* *	+ 62.8	- 0.3
313 Optical and electronic equipment operators	= = 37.0	* *	+ 66.5	= = 0.3
314 Ship and aircraft controllers and technicians	+ 42.0	* *	+ 82.9	+ 0.3
315 Safety and quality inspectors	* *	* *	* *	* *
321 Life science technicians and related associate professionals	- 37.6	* *	= = 38.5	= = 0.2
322 Health associate professionals (except nursing)	= = 38.3	* *	= = 32.9	- 0.3

Source: Analysis of the Annual 2008 European Labour Force

5.14 Hungary

Hungary (HU) has a total of about 187,000 SET technicians which represents 4.9 per cent of the Hungarian workforce. This is less than the EU average of 5.3 per cent of the workforce. The data shows that in Hungary intermediate level qualifications are more important for SET technicians. In Hungary, 81.3 per cent of physical and engineering science technicians as well as 80.6 per cent of health associate professionals have intermediate level qualifications. Computer associate professionals have the highest proportion of high level qualifications at 34.7 per cent.

Table 5.15 shows the relative position of Hungarian SET technicians.

Table 5.15: Features of Hungarian SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	= = 40.6	* *	+ 81.3	- 1.4
312 Computer associate professionals	- 34.5	* *	+ 63.1	- 0.6
313 Optical and electronic equipment operators	= = 39.4	* *	+ 68.3	= = 0.3
314 Ship and aircraft controllers and technicians	* *	* *	* *	* *
315 Safety and quality inspectors	= = 40.0	* *	+ 69.1	+ 1.1
321 Life science technicians and related associate professionals	= = 41.6	* *	+ 69.3	- 0.2
322 Health associate professionals (except nursing)	= = 42.3	* *	+ 80.6	= = 1.3

Source: Analysis of the Annual 2008 European Labour Force

5.15 Ireland

Ireland (IE) has a total of about 48,000 SET technicians which represents 2.3 per cent of the Irish workforce. This is significantly less than the EU average of 5.3 per cent of the workforce. The data shows that where the data is available there is a relatively high proportion of SET technicians in Ireland with intermediate level qualifications.

Table 5.16 shows the relative position of Irish SET technicians compared with the EU average.

Table 5.16: Features of Irish SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	- 37.2	* *	- 30.7	- 1.2
312 Computer associate professionals	n.a.	n.a.	n.a.	n.a.
313 Optical and electronic equipment operators	= = 37.9	* *	- 30.4	- 0.2
314 Ship and aircraft controllers and technicians	- 37.2	* *	- 29.6	- 0.1
315 Safety and quality inspectors	- 39.2	* *	- 21.1	- 0.2
321 Life science technicians and related associate professionals	* *	* *	* *	* *
322 Health associate professionals (except nursing)	-	* *	- 13.2	- 0.6

Source: Analysis of the Annual 2008 European Labour Force

5.16 Italy

Italy (IT) has a total of about 1,896,000 SET technicians which represents 8.2 per cent of the Italian workforce. This is significantly more than the EU average of 5.3 per cent of the workforce. The data shows that relatively high proportions of the Italian SET technicians were qualified at an intermediate level. Ship and aircraft controllers and technicians were the most likely to be qualified at an intermediate level with 81.2 per cent qualified in that manner. All the other SET technician occupations, at least half, were also qualified at the intermediate level. The life science technicians and related associate professionals were the most likely to be qualified at a high level with 35.9 per cent qualified in this manner.

Table 5.17 shows the relative position of Italian SET technicians compared with the EU average.

Table 5.17: Features of Italian SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	= = 40.2	= = 5.1	+ 77.9	+ 3.4
312 Computer associate professionals	= = 37.8	= = 7.0	+ 71.1	+ 1.2
313 Optical and electronic equipment operators	+ 40.8	= = 5.6	+ 64.2	+ 0.4
314 Ship and aircraft controllers and technicians	= = 41.3	= = 9.3	+ 81.2	- 0.1
315 Safety and quality inspectors	= = 42.5	= = 9.3	+ 53.5	- 0.2
321 Life science technicians and related associate professionals	= = 42.5	+ 10.6	+ 54.7	- 0.2
322 Health associate professionals (except nursing)	= = 41.1	+ 12.7	= = 53.5	+ 2.6

Source: Analysis of the Annual 2008 European Labour Force

5.17 Lithuania

Lithuania (LT) has a total of about 65,000 SET technicians which represents 4.3 per cent of the Lithuanian workforce. This is less than the EU average value of 5.3 per cent. The data shows that the available data for Lithuania is sparse and this makes it impossible to generalise. However, the available data suggests that intermediate level qualifications are in the upper end of the distribution. For instance, 61.8 per cent of the physical and engineering science technicians had an intermediate level qualification.

Table 5.18 shows the relative position of Lithuanian SET technicians compared with the EU average.

Table 5.18: Features of Lithuanian SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	= = 40.6	* *	= = 61.8	- 0.7
312 Computer associate professionals	* *	* *	* *	* *
313 Optical and electronic equipment operators	* *	* *	* *	* *
314 Ship and aircraft controllers and technicians	* *	* *	* *	* *
315 Safety and quality inspectors	= = 42.0	* *	- 46.2	= = 0.3
321 Life science technicians and related associate professionals	+ 45.1	* *	= = 55.1	+ 0.5
322 Health associate professionals (except nursing)	+ 42.6	* *	- 44.2	+ 2.4

Source: Analysis of the Annual 2008 European Labour Force

5.18 Luxembourg

Luxembourg (LU) has a total of about 7,000 SET technicians which represents 3.4 per cent of Luxembourg's workforce. This is less than the EU average value of 5.3 per cent. The data shows that for many of the SET technician occupations in Luxembourg it is impossible to reliably report details of the level of qualifications due to numbers falling below reporting limits. However, the available data which is necessarily not terribly reliable suggests that normally computer associate professionals have intermediate level qualifications while health associate professionals have high level qualifications.

Table 5.19 shows the relative position of Luxembourger SET technicians compared with the EU average.

Table 5.19: Features of Luxembourger SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	= = 39.4	* *	= = 65.1	- 1.1
312 Computer associate professionals	= = 38.1	* *	+ 86.0	+ 1.0
313 Optical and electronic equipment operators	= = 38.3	* *	+ 77.5	= = 0.3
314 Ship and aircraft controllers and technicians	- 36.3	* *	+ 70.5	+ 0.3
315 Safety and quality inspectors	* *	* *	* *	* *
321 Life science technicians and related associate professionals	= = 42.5	* *	= = 63.0	- 0.1
322 Health associate professionals (except nursing)	= = 37.5	* *	- 18.5	- 0.6

Source: Analysis of the Annual 2008 European Labour Force

5.19 Latvia

Latvia (LV) has a total of about 46,000 SET technicians which represents 4.3 per cent of the Latvian workforce. This is less than the EU average of 5.3 per cent. The data shows that in Latvia some of the SET technician occupations were predominantly qualified at the intermediate level, most notably ship and aircraft controllers and technicians where 92.7 per cent had intermediate level qualifications. Table 5.20 shows the relative position of Latvian SET technicians compared with the EU average.

Table 5.20: Features of Latvian SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	= = 40.1	+ 5.7	- 47.1	= =
312 Computer associate professionals	= = 34.7	* *	- 35.0	= =
313 Optical and electronic equipment operators	* *	* *	* *	* *
314 Ship and aircraft controllers and technicians	+ 48.7	* *	+ 92.7	-
315 Safety and quality inspectors	= = 41.7	* *	+ 77.9	-
321 Life science technicians and related associate professionals	= = 40.4	* *	= = 51.7	+
322 Health associate professionals (except nursing)	* *	* *	* *	* *

Source: Analysis of the Annual 2008 European Labour Force

5.20 Malta

Malta (MT) does not allow Eurostat to include their LFS micro-data in the confidential micro-data release. However, Malta has a total of about 9,000 SET technicians which represents 5.9 per cent of the Maltese workforce. This is more than the EU average value of 5.3 per cent. However, the lack of further data means that the analysis of SET technicians within Malta is limited. The data shows that it is only possible to examine the highest educational qualifications of physical and engineering science technicians. Overall, this shows that the bulk of this group have intermediate level qualifications and the rest largely have low level qualifications. Given the absence of Maltese micro-data from the ELFS data, it is difficult to say much more about the Maltese SET technicians.

5.21 Netherlands

The Netherlands (NL) has a total of about 521,000 SET technicians which represents 6.2 per cent of the Dutch workforce. This is more than the EU average value of 5.3 per cent. The data shows that for some of the SET technician occupations more than normal have high level qualifications. These are the optical and electronic equipment operators with 52.4 per cent and ship and aircraft controllers and technicians with 51.0 per cent with high level qualifications. By contrast, 60.7 per cent of the physical and engineering science technicians have an intermediate level qualification.

Table 5.21 shows the relative position of Dutch SET technicians compared with the EU average.

Table 5.21: Features of Dutch SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	= = 40.0	+ 11.2	= = 60.7	= = 1.8
312 Computer associate professionals	= = 38.4	+ 17.1	= = 56.7	+ 1.4
313 Optical and electronic equipment operators	= = 39.2	- 3.5	- 37.6	+ 0.4
314 Ship and aircraft controllers and technicians	= = 40.6	+ 12.1	= = 36.7	+ 0.2
315 Safety and quality inspectors	= = 43.7	+ 15.4	= = 52.2	- 0.1
321 Life science technicians and related associate professionals	= = 40.3	= = 8.1	- 37.0	= = 0.3
322 Health associate professionals (except nursing)	= = 41.7	+ 14.3	= = 47.7	+ 1.8

Source: Analysis of the Annual 2008 European Labour Force

5.22 Norway

Norway (NO) has a total of about 172,000 SET technicians which represents 7.0 per cent of the Norwegian workforce. This is more than the EU average value of 5.3 per cent. The data shows, where it is possible to tell, that Norwegian SET technicians are more likely to have high level qualifications than in most of the other countries.

Table 5.22 shows the relative position of Norwegian SET technicians compared with the EU average.

Table 5.22: Features of Norwegian SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	+ 43.4	+ 19.2	- 48.1	+ 3.0
312 Computer associate professionals	= = 38.5	+ 17.0	- 42.8	+ 1.5
313 Optical and electronic equipment operators	* *	* *	* *	* *
314 Ship and aircraft controllers and technicians	= = 44.0	* *	+ 74.2	+ 0.6
315 Safety and quality inspectors	= = 45.7	* *	- 41.9	= = 0.4
321 Life science technicians and related associate professionals	= = 43.8	* *	- 23.6	= = 0.3
322 Health associate professionals (except nursing)	= = 42.2	* *	- 16.5	- 0.9

Source: Analysis of the Annual 2008 European Labour Force

5.23 Poland

Poland (PL) has a total of about 568,000 SET technicians which represents 3.7 per cent of the Polish workforce. This is less than the EU average value of 5.3 per cent of the workforce. The data shows that overwhelmingly SET technicians in Poland have intermediate level qualifications. Physical and engineering science technicians at 90.1 per cent, and life science technicians and related associate professionals at 90.9 per cent are at the extreme. The exception to the rule was ship and aircraft controllers and technicians where 65.2 per cent had high level qualifications.

Table 5.23 shows the relative position of Polish SET technicians compared with the EU average.

Table 5.23: Features of Polish SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	= = 40.8	= = 3.7	+ 90.1	- 1.5
312 Computer associate professionals	+ 40.8	= = 3.7	+ 87.6	- 0.3
313 Optical and electronic equipment operators	+ 40.8	= = 3.7	+ 75.1	- 0.2
314 Ship and aircraft controllers and technicians	= = 40.8	= = 3.7	- 34.8	- 0.1
315 Safety and quality inspectors	= = 40.8	= = 3.7	+ 73.4	+ 0.7
321 Life science technicians and related associate professionals	= = 39.6	* *	+ 90.9	= = 0.3
322 Health associate professionals (except nursing)	= = 39.6	* *	+ 82.1	- 0.6

Source: Analysis of the Annual 2008 European Labour Force

5.24 Portugal

Portugal (PT) has a total of about 160,000 SET technicians which represents 3.3 per cent of the Portuguese workforce. This is less than the EU average value of 5.3 per cent of the workforce. The data shows that in Portugal there is a significant proportion of SET technicians with low level qualifications. Generally, the qualification profile is even with similar proportions with low, intermediate and high level qualifications. This means that 41.6 per cent of optical and electronic equipment operators have low level qualifications. While by comparison, 65.1 per cent of the computer associate professionals have intermediate level qualifications and 44.4 per cent of life science technicians and related associate professionals have high level qualifications.

Table 5.24 shows the relative position of Portuguese SET technicians compared with the EU average.

Table 5.24: Features of Portuguese SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	- 38.4	* *	- 43.3	- 1.3
312 Computer associate professionals	- 33.1	* *	+ 65.1	- 0.7
313 Optical and electronic equipment operators	- 35.7	* *	- 33.7	= = 0.2
314 Ship and aircraft controllers and technicians	- 37.5	* *	= = 57.9	- 0.0
315 Safety and quality inspectors	= = 41.4	* *	- 40.9	- 0.3
321 Life science technicians and related associate professionals	- 38.2	* *	- 33.7	= = 0.2
322 Health associate professionals (except nursing)	- 37.9	* *	- 25.1	- 0.5

Source: Analysis of the Annual 2008 European Labour Force

5.25 Romania

Romania (RO) has a total of about 360,000 SET technicians which represents 4.1 per cent of the Romanian workforce. This compares with an EU average value of 5.3 per cent of the EU workforce. The data shows that in Romania, as in many of the former communist accession states, the emphasis amongst the SET technicians is on intermediate level qualifications. The percentages with intermediate level qualifications range from 93.3 per cent amongst the physical and engineering science technicians to 78.8 per cent with the computer associate professionals.

Table 5.25 shows the relative position of Romanian SET technicians compared with the EU average.

Table 5.25: Features of Romanian SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	+ 44.6	* *	+ 93.3	- 1.3
312 Computer associate professionals	- 34.3	* *	+ 78.8	- 0.3
313 Optical and electronic equipment operators	- 36.8	* *	+ 81.7	- 0.1
314 Ship and aircraft controllers and technicians	- 39.2	* *	- 36.2	= = 0.1
315 Safety and quality inspectors	- 39.9	* *	+ 88.5	= = 0.3
321 Life science technicians and related associate professionals	= = 41.5	* *	+ 92.3	- 0.2
322 Health associate professionals (except nursing)	= = 38.6	* *	+ 88.8	+ 1.7

Source: Analysis of the Annual 2008 European Labour Force

5.26 Sweden

Sweden (SE) has a total of about 301,000 SET technicians which represents 6.7 per cent of the Swedish workforce. This is more than the EU average of 5.3 per cent of the EU workforce. The data shows that although intermediate level qualifications are important for SET technicians in Sweden, there are some occupations, particularly in the health area, where high level qualifications predominate. Of the computer associate professionals 68.2 per cent had an intermediate level qualification, while 85.1 per cent of the life science technicians and related associate professionals had a high level qualification.

Table 5.26 shows the relative position of Swedish SET technicians compared with the EU average.

Table 5.26: Features of Swedish SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	+ 44.1	= = 19.7	+ 65.0	+ 3.0
312 Computer associate professionals	+ 39.4	= = 19.0	+ 68.2	+ 1.0
313 Optical and electronic equipment operators	= = 41.1	+ 14.9	+ 63.7	+ 0.4
314 Ship and aircraft controllers and technicians	= = 43.4	+ 16.9	- 32.3	+ 0.3
315 Safety and quality inspectors	+ 45.9	+ 19.7	= = 56.6	- 0.3
321 Life science technicians and related associate professionals	+ 48.3	= = 24.6	- 8.7	= = 0.3
322 Health associate professionals (except nursing)	= = 44.0	+ 30.1	- 24.1	= = 1.4

Source: Analysis of the Annual 2008 European Labour Force

5.27 Slovenia

Slovenia (SI) has a total of about 59,000 SET technicians which represents 6.1 per cent of the Slovenian workforce. This is more than the 5.3 per cent of the EU workforce that are SET technicians. The data shows that apart from the ship and aircraft controllers and technicians, the bulk of the Slovenian SET technicians had intermediate level qualifications. Indeed, 93.4 per cent of the physical and engineering science technicians had intermediate level qualifications. The group with the lowest proportion of intermediate level qualifications were the ship and aircraft controllers and technicians at 40.9 per cent.

Table 5.27 shows the relative position of Slovenian SET technicians compared with the EU average.

Table 5.27: Features of Slovenian SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	- 38.8	= = 10.0	+ 93.4	+ 3.7
312 Computer associate professionals	= = 38.8	= = 10.0	+ 88.1	+ 0.9
313 Optical and electronic equipment operators	= = 38.8	= = 10.0	+ 69.1	+ 0.3
314 Ship and aircraft controllers and technicians	- 38.8	= = 10.0	= = 40.9	= = 0.2
315 Safety and quality inspectors	* *	* *	* *	* *
321 Life science technicians and related associate professionals	= = 38.8	+ 17.2	+ 74.8	= = 0.3
322 Health associate professionals (except nursing)	= = 38.8	+ 17.2	+ 74.3	- 0.7

Source: Analysis of the Annual 2008 European Labour Force

5.28 Slovakia

Slovakia (SK) has a total of about 154,000 SET technicians which represents 6.4 per cent of the Slovakian workforce. This is a greater proportion of the workforce than the average EU value of 5.3 per cent of the workforce. The data shows that Slovakia's SET technicians are predominately qualified to an intermediate level. The data shows the proportion ranges from 63.4 per cent with the optical and electronic equipment operators to 75.3 per cent with the safety and quality inspectors.

Table 5.28 shows the relative position of Slovakian SET technicians compared with the EU average.

Table 5.28: Features of Slovakian SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Proportion of the Workforce
311 Physical and engineering science technicians	= = 42.0	* *	+ 74.3	+ 3.1
312 Computer associate professionals	- 33.8	* *	+ 71.0	+ 1.2
313 Optical and electronic equipment operators	- 35.8	* *	= = 63.4	- 0.2
314 Ship and aircraft controllers and technicians	- 39.2	* *	+ 71.0	= = 0.1
315 Safety and quality inspectors	- 38.9	* *	+ 75.3	+ 0.8
321 Life science technicians and related associate professionals	= = 42.8	* *	+ 68.4	= = 0.5
322 Health associate professionals (except nursing)	= = 40.6	* *	+ 72.5	- 0.5

Source: Analysis of the Annual 2008 European Labour Force

5.29 United Kingdom

The United Kingdom (UK) has about 1,069,000 SET technicians which represents 3.7 per cent of the UK workforce. This compares with an EU average value of 5.3 per cent. The data shows that the UK has a fairly even mix between intermediate and high level qualifications for most of the SET technician occupations. The exception to this is the life science technicians and related associate professionals where 77.7 per cent had high level qualifications. Additionally, the optical and electronic equipment operators as well as the safety and quality inspectors both have over half with high level qualifications at 57.6 and 59.8 per cent respectively.

Table 5.29 shows the relative position of UK SET technicians compared with the EU average.

Table 5.29: Features of UK SET technicians compared with the average

	Average Age	Per cent Trained	Inter-mediate Level	Pro-portion of the Workforce
311 Physical and engineering science technicians	= = 40.7	= = 20.9	- 44.6	- 1.1
312 Computer associate professionals	= = 35.9	+ 22.7	- 39.6	= = 0.6
313 Optical and electronic equipment operators	= = 38.6	+ 17.5	- 31.1	= = 0.3
314 Ship and aircraft controllers and technicians	= = 42.4	+ 30.8	= = 49.5	= = 0.1
315 Safety and quality inspectors	= = 44.8	+ 28.2	- 30.6	= = 0.3
321 Life science technicians and related associate professionals	= = 39.6	+ 27.5	- 14.5	- 0.1
322 Health associate professionals (except nursing)	= = 39.7	+ 37.3	- 35.8	= = 1.1

Source: Analysis of the Annual 2008 European Labour Force

6 Summary and Implications for the UK

6.1 Relative numbers of SET technicians

In part, the UK's relative numbers can be explained by the relative size of the main sectors employing the SET technicians. Table 6.1 presents this data and shows that some UK sectors employ fewer than on average across the EU, while others employ more. However, the relative lack of sectoral linkage in the UK (explored in more detail in Section 6.4) limits this explanation. Despite this proviso, the following observations can be made:

- Physical and engineering science technicians make up a smaller proportion of the UK workforce than the EU 27 average. This is probably because the UK's manufacturing sector, which represents 11.4 per cent of total employment, is smaller than the EU 27 average of 17.3 per cent. This implies that any expansion of UK manufacturing is likely to be accompanied by an increased need for these technicians.
- Computer associate technicians – the UK's Information and communication sector at 4.1 per cent of the workforce is larger than the EU average of 2.9 per cent of the workforce. Despite this, the UK workforce has a smaller proportion of computer associate technicians than the EU 27 average. Again, this suggests that people with the necessary background may be important to any expansion of this sector.
- Optical and electronic equipment operators – as noted before, the UK's information and communication sector employment is greater than on average across the EU. This would also suggest a greater proportion of technicians in this occupation. However, in practice the size of the UK's computing sector does not support the numbers of technicians that are found elsewhere. This can either mean that the sector uses higher level skills and does not need technicians or that there is an unmet need for technicians.

- Ship and aircraft controllers and technicians – the UK's transportation and storage sector represents a slightly larger proportion of the workforce, possibly reflecting a longer coastline than some countries. This also reflects the slightly greater proportion of the workforce for this group found in the LFS. Here, the relationship between sector size and the number of technicians is probably more determined by regulatory factors.

Table 6.1: Relative employment in NACE 2007 sectors in the EU 27 and UK in 2008

NACE 2007	European Union 27 % of total employment	United Kingdom % of total employment
Agriculture, forestry and fishing	4.7	1.0
Mining and quarrying	0.4	0.4
Manufacturing	17.3	11.4
Electricity, gas, steam and air conditioning supply	0.7	0.5
Water supply; sewerage, waste management and remediation activities	0.7	0.7
Construction	8.5	9.1
Wholesale and retail trade; repair of motor vehicles and motorcycles	14.2	14.5
Transportation and storage	5.2	5.5
Accommodation and food service activities	4.3	4.3
Information and communication	2.9	4.1
Financial and insurance activities	3.0	4.4
Real estate activities	0.7	0.8
Professional, scientific and technical activities	4.6	5.4
Administrative and support service activities	3.7	4.0
Public administration and defence; compulsory social security	7.1	7.1
Education	6.8	8.9
Human health and social work activities	9.6	12.2
Arts, entertainment and recreation	1.6	2.5
Other service activities	2.4	2.3
Total – All NACE branches	100.0	100.0

Source: IES analysis of Eurostat LFS based data covering the third quarter of 2008

- Safety and quality inspectors – as already mentioned, the UK's manufacturing sector is smaller in terms of employment than on average across the EU. Despite this, the proportion of the workforce in this occupation is only slightly smaller. This suggests that UK manufacturing may make a greater use of this type of skill than elsewhere.

- Life science technicians and related occupations – in other countries, these are predominantly linked to the agriculture, forestry and fishing sector which in the UK represents one per cent of the workforce compared with the EU average of 4.7 per cent. However, in the UK this group is also important to the pharmaceutical and bioscience sector. This may explain why the UK uses more of these skills than the size of agricultural employment would suggest.
- Health associate professionals – it is assumed that these are linked to the human health and social work activities sector which in the UK represents 12.2 per cent of employment compared with the 9.6 per cent for the EU 27. As the UK has a slightly smaller proportion of the technicians in this group than across the EU as a whole, this suggests that potentially there is an unmet demand for more of these skills.

6.2 Relative qualification levels

Generally, the UK has fewer people with intermediate level skills in the workforce and more with high level qualifications than the average across the EU, as shown in Table 6.2.

Table 6.2: Level of highest qualification by country

	Intermediate	High level
European Union*	49.0	26.9
Belgium	40.7	37.9
Bulgaria	60.3	25.2
Czech Republic	78.5	15.7
Denmark	42.5	32.1
Germany	59.1	26.6
Estonia	55.0	34.7
Ireland	37.8	35.5
Greece	39.3	26.2
Spain	24.3	34.5
France	44.5	31.4
Italy	45.3	17.0
Cyprus	39.8	37.3
Latvia	60.6	27.0
Lithuania	59.0	34.7
Luxembourg	40.7	31.3
Hungary	64.4	23.1
Netherlands	42.1	31.3

	Intermediate	High level
Austria	64.2	18.2
Poland	67.7	23.4
Portugal	15.5	15.2
Romania	60.7	14.8
Slovenia	61.5	24.0
Slovakia	78.8	16.7
Finland	46.1	37.3
Sweden	54.1	31.3
United Kingdom	42.7	32.3
Iceland	32.0	27.2
Norway	44.6	34.2

** Note excludes Malta as Maltese micro-data not included in release*
Source: IES analysis of Eurostat LFS based data covering the third quarter of 2008

However, there are specific differences for each of the component ISCO occupations amongst the SET technicians.

Table 6.3: Level of qualifications of SET technicians in the UK and EU

	UK Intermediate	UK High	EU Intermediate	EU High
Physical and engineering science technicians	46.3	41.8	61.7	29.4
Computer associate technicians	38.5	46.8	54.0	39.4
Optical and electronic equipment operators	32.1	58.1	50.5	38.6
Ship and aircraft controllers and technicians	49.1	40.1	48.6	44.2
Safety and quality inspectors	32.8	50.6	56.4	32.7
Life science technicians and related occupations	12.4	77.5	46.7	47.3
Health associate professionals	34.3	53.0	48.8	44.4
All employed	42.7	32.3	49.0	26.9

Source: IES analysis of Eurostat LFS based data covering the third quarter of 2008

Generally, it can be seen that the UK SET technicians are much more likely to have high level qualifications and less likely to have intermediate level qualifications than in the EU as a whole. Given that the UK generally has fewer SET technicians than on average across the EU, this means that the relative numbers with intermediate level qualifications need to rise if the overall levels of high and intermediate qualified SET technicians are going to be consistent with EU levels. The overall EU figures are in part influenced by the former communist accession

countries which had a strong tradition of intermediate level qualifications. However, as these countries are relatively small they do not have a major influence on the overall figures and simply show that these types of occupations can be filled with people with a cheaper education and training.

6.3 Relative levels of training

Overall, the UK tends to have relatively high levels of job related training. Using a slightly different definition of training, 2008 average annual LFS data shows 19.9 per cent of UK 25 to 64 year olds participating in education and training over the four weeks prior to the survey. This compares to an EU average of 9.5 per cent involved in education and training. This is also the case amongst the SET technicians. Necessarily using a different basis of those who are employed and aged 16 to 75, the UK shows the following levels of work related training:

- Physical and engineering science technicians – 20.9 per cent in the UK received training in the previous four weeks. Given the relative importance of this group for the overall number of UK SET technicians, this figure is closer to the overall average than the others.
- Computer associate technicians – 22.7 per cent received training in the previous four weeks. This slightly higher proportion receiving training than the physical and engineering science technicians may reflect greater rates of technical change in this area.
- Optical and electronic equipment operators – 17.5 per cent in the UK received training in the previous four weeks. This is a lower figure than the other SET technicians and possibly reflects lower levels of technical change in this area.
- Ship and aircraft controllers and technicians – 30.8 per cent in the UK received training in the previous four weeks. This higher than average figure probably reflects regulatory based CPD requirement.
- Safety and quality inspectors – 28.2 per cent in the UK received training in the previous four weeks. This is higher than the norm for UK SET technicians and possibly reflects the need to keep up to date when performing these functions.
- Life science technicians and related occupations – 27.5 per cent in the UK received training in the previous four weeks. This is higher than the norm for UK SET technicians and possibly reflects the need to keep up to date when performing these functions.
- Health associate professionals – 37.3 per cent in the UK received training in the previous four weeks. This higher than average figure probably reflects regulatory based CPD requirements.

However, although a high level of training can indicate a high level of responsiveness to changing technologies, it can also indicate that the initial qualifications are inappropriate and there is a need for retraining. This is probably not the case in the UK and the greater extent of training in the UK is a positive story.

6.4 Sectoral linkage

Generally, the UK has less sectoral linkage than other countries in the EU. By this it means that unlike in most of the other larger EU countries, it proved impossible to identify a main sector employing the SET technicians. Compared with other countries in the EU it is difficult to identify where SET technicians in the UK are employed. The possible reasons for this lack of sectoral specificity are as follows:

- Difficulties coding companies using the new Standard Industrial Classification 2007 which has only just been introduced. This is possible, but would apply equally to the other countries.
- SET technician functions are more likely in the UK to be provided by contractors and suppliers based in other sectors rather than directly employed by the target sector.
- Unspecific job titles mean some SET technicians in critical sectors are not identified as such. This is probably the most likely reason as in the UK there is not the continental tradition of specific sectoral qualifications being aligned with specific job titles.

6.5 Potential policy response

The UK currently has a skills monitoring and development system that is based around Sector Skills Councils (SSCs). These bodies are employer led and are responsible for the development of sector specific qualifications that meet employers' changing requirements. In principal, these bodies should identify the qualifications that are needed that are in short supply. They also have a role in ensuring that the various training providers are in a position to deliver these skills.

The lack of sectoral linkage, noted in Section 6.4, is a potential issue and every effort should be made by the SSCs to encourage the consistent use of sector and qualification specific job titles in order to simplify reliable labour market analyses. In countries such as Germany, the more specific job titles help to ensure consistent skills amongst occupational groups.

The major problem that needs to be addressed is the relative shortage of SET technicians qualified at an intermediate level. All of the SET technician

occupations have sufficient numbers qualified to a high level and the relative overall numerical shortage can be mainly explained by the lack of people with intermediate level qualifications. The sort of qualifications that will deliver the numbers required are currently delivered as part of apprenticeships. However, more generally there is a need for clear, well understood and valued technical training routes that lead to SET technician roles. There will need to be an effort to emphasise SET technician type apprenticeships over and above apprenticeships in other areas. This will have to be supported by clearer and more specific careers advice to encourage suitably qualified people to pursue this route.

7 Bibliography

BIS (2009), *Using the Labour Force Survey to measure highest levels of qualification held within the working age population*, Department for Business, Innovation and Skills

ILO (1988), *International Standard Classification of Occupations (ISCO) 1988*, International Labour Organisation

Jagger N, Nesta L, Gerova V, Patel P (2005), *Sectors Matter: An International Study of Sector Skills and Productivity*, Research Report RR14, Sector Skills Development Agency

ONS (2001), *Standard Occupational Classification 2000*, Volume 1, Office of National Statistics

ONS (2003), *Volume 1: Background and methodology*, Office of National Statistics

Appendix 1

Table A1.1: Occupations with more than 30 per cent at NQF 2 and 3

SOC Codes	Description	% Qualified at NQF 4 and 5	Included
1122	Managers in construction	45.6	
1132	Marketing and sales managers	31.7	
1142	Customer care managers	56.6	
1151	Financial institution managers	41.9	
1152	Office managers	44.2	
1161	Transport and distribution managers	41.7	
1162	Storage and warehouse managers	44.8	
1163	Retail and wholesale managers	43.7	
1185	Residential and day care managers	31.8	
1221	Hotel and accommodation managers	40.6	
1223	Restaurant and catering managers	46.0	
1224	Publicans and managers licensed premises	46.0	
1231	Property, housing and land managers	33.7	
1232	Garage managers and proprietors	67.0	
1233	Hairdressers and beauty salon managers and proprietors	72.7	
1234	Shopkeepers, wholesale and retail dealers	44.6	
1239	Managers and proprietors in other services n.e.c.	32.8	
2122	Mechanical engineers	30.3	
2123	Electrical engineers	38.0	
2128	Planning and quality control engineers	35.8	
2129	Engineering professionals n.e.c.	31.6	
3111	Laboratory technicians	41.2	Yes
3112	Electrical and electronic technicians	55.1	Yes
3113	Engineering technicians	54.2	Yes

SOC Codes	Description	% Qualified at NQF 4 and 5	Included
3114	Building and civil engineering technicians	33.6	Yes
3115	Quality assurance technicians	34.7	Yes
3119	Science and engineering technicians n.e.c.	38.3	Yes
3131	IT operations technicians	31.4	Yes
3132	IT user support technicians	43.8	Yes
3217	Pharmaceutical dispensers	60.0	Yes
3218	Medical and dental technicians	33.8	Yes
3231	Youth and community workers	33.7	
3232	Housing and welfare officers	35.8	
3311	NCOs and other ranks	57.3	
3312	Police officers (sergeant and below)	53.0	
3313	Fire service officers (leading officer and below)	58.7	
3314	Prison service officers (below principal officer)	52.3	
3319	Protective services associate professionals n.e.c.	49.2	
3413	Actors, entertainers	38.9	
3442	Sports coaches, instructors and officials	50.7	
3443	Fitness instructors	52.1	
3520	Legal associate professionals	35.5	
3531	Estimators, valuers and assessors	44.3	
3532	Brokers	51.5	
3533	Insurance underwriters	62.1	
3534	Finance and investment analyst and advisers	34.0	
3537	Financial and accounting technicians	46.9	
3541	Buyers and purchasing officers	38.9	
3542	Sales representatives	47.4	
3544	Estate agents, auctioneers	43.2	
3561	Public service associate professionals	32.2	
3562	Personnel and industrial relations officers	35.8	
3563	Vocational and industrial trainers and instructors	32.8	
3567	Occupational hygienists and health safety officers	32.4	
4111	Civil Service executive officers	53.9	
4112	Civil Service administrative officers and assistants	52.8	
4113	Local government clerical officers and assistants	50.5	
4114	Officers non-governmental organisations	37.2	
4121	Credit controllers	55.5	
4122	Accounts wages clerk, bookkeeper	46.9	
4123	Counter clerks	58.2	

SOC Codes	Description	% Qualified at NQF 4 and 5	Included
4131	Filing and other records assistants and clerks	46.7	
4132	Pensions and insurance clerks	58.9	
4133	Stock control clerks	49.2	
4134	Transport and distribution clerks	44.9	
4135	Library assistants and clerks	40.6	
4136	Database assistants and clerks	45.9	
4137	Market research interviewers	46.3	
4142	Communication operators	41.3	
4150	General office assistants or clerks	46.1	
4211	Medical secretaries	47.7	
4212	Legal secretaries	42.5	
4213	School secretaries	45.3	
4214	Company secretaries	46.5	
4215	Personal assists and other secretaries	48.2	
4216	Receptionists	46.5	
5111	Farmers	33.6	
5113	Gardeners and grounds (wo)men	40.3	
5119	Agricultural and fishing trades n.e.c.	42.5	
5213	Sheet metal workers	64.9	Yes
5215	Welding trades	58.7	Yes
5216	Pipe fitters	74.8	Yes
5221	Metal machine setter and setter-operator	64.8	Yes
5222	Tool-makers, tool-fitters and markers-out	72.0	Yes
5223	Metal working prod and maintenance fitter	64.9	
5224	Precision instrument makers and repairers	68.7	Yes
5231	Motor mechanics, auto engineers	68.5	
5232	Vehicle body builders and repairers	58.9	
5234	Vehicle spray painters	54.4	
5241	Electricians, electrical fitters	77.8	Yes
5242	Telecommunications engineers	52.8	Yes
5243	Lines repairers and cable jointers	73.8	Yes
5245	Computer engineer, installation and maintenance	29.5	Yes
5249	Electrical and electronic engineer n.e.c.	61.4	Yes
5312	Bricklayers, masons	71.2	
5313	Roofers, roof tilers and slaters	48.6	
5314	Plumbing, heating and ventilating engineers	78.6	Yes
5315	Carpenters and joiners	73.4	

SOC Codes	Description	% Qualified at NQF 4 and 5	Included
5316	Glaziers, window fabric and fitters	52.5	
5319	Construction trades n.e.c.	48.5	
5321	Plasterers	56.2	
5322	Floorers and wall tilers	53.9	
5323	Painters and decorators	61.4	
5422	Printers	74.0	
5423	Bookbinders and print finishers	60.5	
5431	Butchers, meat cutters	51.7	
5432	Bakers, flour confectioners	42.3	
5434	Chefs, cooks	55.4	
5492	Furniture maker, other craft woodworkers	60.3	
6111	Nursing auxiliaries and assistants	46.9	
6112	Ambulance staff (excluding paramedics)	48.1	
6113	Dental nurses	53.4	
6114	House parents and residential wardens	45.1	
6115	Care assistants and home carers	62.8	
6121	Nursery nurses	63.4	
6122	Childminders and related occupations	57.2	
6123	Playgroup leaders and assistants	55.7	
6124	Educational assistants	49.3	
6139	Animal care occupations n.e.c.	60.1	
6211	Sports and leisure assistants	65.3	
6212	Travel agents	58.2	
6214	Air travel assistants	47.7	
6221	Hairdressers, barbers	77.0	
6222	Beauticians and related occupations	54.4	
6231	Housekeepers and related occupations	42.5	
6232	Caretakers	40.9	
7111	Sales and retail assistants	51.5	
7112	Retail cashiers/check-out operators	48.4	
7113	Telephone salespersons	49.2	
7122	Debt, rent and other cash collectors	47.4	
7123	Rounds(wo)men and van salespersons	45.9	
7129	Sales related occupations n.e.c.	41.4	
7211	Call centre agents and operators	49.4	
7212	Customer care occupations	53.7	
8111	Food, drink and tobacco process operatives	40.3	

SOC Codes	Description	% Qualified at NQF 4 and 5	Included
8114	Chemical and related process operatives	53.8	
8116	Plastics process operatives	36.7	
8121	Paper and wood machine operatives	45.1	
8125	Metal working machine operatives	49.4	
8129	Plant and machine operatives n.e.c.	47.1	
8131	Assemblers (electrical products)	39.0	
8132	Assemblers (vehicle and metal goods)	47.1	
8133	Routine inspectors and testers	52.0	
8137	Sewing machinists	38.5	
8139	Assemblers and routine operatives n.e.c.	43.9	
8141	Scaffolders, stagers, riggers	47.0	
8142	Road construction operatives	45.7	
8149	Construction operatives n.e.c.	60.8	
8211	Heavy goods vehicle drivers	45.9	
8212	Van drivers	38.3	
8213	Bus and coach drivers	50.4	
8214	Taxi, cab drivers and chauffeurs	40.5	
8215	Driving instructors	44.5	
8218	Air transport operatives	58.0	
8219	Transport operatives n.e.c.	50.4	
8222	Fork-lift truck drivers	46.7	
8229	Mobile machine drivers and operatives	52.6	
9111	Farm workers	32.8	
9121	Labourers build and woodworking trades	37.1	
9129	Labourer and other construction trades n.e.c.	43.9	
9134	Packers, bottlers, canners, fillers	34.5	
9139	Labourers process and plant operations n.e.c.	43.0	
9149	Other good handling and storage occupation n.e.c.	39.5	
9211	Post worker, mail sort, messenger, courier	40.5	
9219	Elementary office occupations n.e.c.	53.2	
9223	Kitchen and catering assistants	46.7	
9224	Waiters, waitresses	55.3	
9225	Bar staff	56.2	
9226	Leisure and theme park attendants	50.1	
9233	Cleaners, domestics	30.7	
9235	Refuse and salvage occupations	49.6	
9241	Security guards and related occupations	46.2	

SOC Codes	Description	% Qualified at NQF 4 and 5	Included
9244	School mid-day assistants	37.3	
9249	Elementary security occupation n.e.c.	47.7	
9251	Shelf fillers	42.9	
9259	Elementary sales occupations n.e.c.	48.4	

Source: IES Analysis of July to September 2009 LFS

Appendix 2

Following the BIS conversion of LFS highest qualifications to the NQF (BIS, 2009) we have taken NQF Level 4, to include the following qualifications:

- NVQ Level 4
- Diploma in Higher Education
- HNC, HND and BTEC Higher
- RSA/OCR Higher Diploma
- Foundation degrees
- Other HE below first degree.

At the same time we have also taken the following qualifications to be equivalent to NQF Levels 2 and 3:

- NVQ Level 3 and NVQ Level 2
- Advanced and Intermediate Welsh Baccalaureates
- International Baccalaureates
- GNVQ Advanced and GNVQ Intermediate
- A Levels or equivalent
- RSA Advanced Diplomas
- OND, ONC, BTEC National
- City and Guilds Advanced Craft
- Scottish CSYS
- SCE Higher or equivalent
- Access to HE qualifications
- More than one AS Level
- Trade Apprenticeship
- RSA/OCR Diploma
- City & Guilds Craft
- Five or more O Levels or GCSE grade A* to C or equivalents
- 45 per cent of those reporting other qualifications.