

## **UK Standard of Professional Engineering Competence (UK-SPEC) fourth edition: summary of key changes**

### **Overall approach**

1. The overall approach in redrafting UK-SPEC was to aim for greater clarity, making the requirements, ie the Standard itself, more obvious, while providing better examples of how applicants might provide evidence of having met the Standard. We also aimed to make the new edition more informative, particularly with respect to assessment, and tried to reduce duplication of information throughout.

An emphasis was placed on accessible language, clarity of structure and internal consistency with other standards documents. The text was drafted with accessible language principles in mind: sentences under 25 words where possible, with active tenses, while aiming to not alter the precise meaning of technical, engineering and regulatory terms.

### **Wording changes.**

2. For the sake of consistency and clarity, a number of terms were slightly altered.
  - a) Applicant  
Potential registrants were referred to as both candidates and applicants. Applicant was the term used in the tables, so it was applied consistently in place of 'candidate'.
  - B) Recognised Qualifications and Individual Assessment  
These terms replace 'Standard Route' and 'Individual Route'. These terms were selected in order to convey the sense that both routes are equal in status.
  - c) Annex  
This term was removed as it seemed an inappropriate name for key sections of this document.
  - d) Previous editions of UK-SPEC alternated between the terms 'PEI', 'Professional Engineering Institution', 'licensed PEI', and 'Institution'. In this edition we have used 'Licensee' to provide consistency with the term used in the revised Engineering Council Bye-laws.

### **Revised body text**

3. Key changes are as follows:
  - a) Inclusion of a diagram setting out the relationship of the Standards documents to each other.
  - b) Separation of 'Why register?' section into 'Benefits for individuals' and 'Benefits for employers'.
  - c) New section, 'How to become professionally registered', containing an overview of the requirements for registration and an overview of assessment methods.
  - d) New section 'Routes to registration: meeting the requirements'.
  - e) The 'Routes to registration' section is illustrated with a new flowchart on the assessment process.

- f) Table 2 is entitled 'Recognised qualifications' instead of 'Exemplifying qualifications'
- g) The individual route section is now entitled 'individual assessment'.
- h) The 'Preparing for registration' section has been edited to reduce repetition.
- i) The 'Assessment of competence and commitment' section is now entitled; 'Professional review: assessing competence and commitment'. This section has been broken down into sections on scrutiny of qualifications and the professional review itself.
- j) The section on maintaining and enhancing competence has been retitled; 'Retention of the title requires:'. This section has been shortened substantially to avoid repetition on Continuing Professional Development (CPD). To avoid out-of-date information on CPD policy being included, a link is now provided.
- k) The comparison table of EngTech, IEng and CEng competences does not now contain the examples of evidence, as the previous version was very difficult to read for people with visual impairment and incompatible with screen-readers. It was also difficult to compare across registration categories. There was also undue repetition of information from elsewhere in the document. The comparison table now precedes the information on professional and ethical behaviour.  
  
A full table of competences and examples of evidence has been made available as a stand-alone pdf document.
- l) The CPD section has been rewritten by the Professional Development Steering Group to include updated information on the CPD Code and sampling. A link to the CPD policy statement is now included.
- m) Guidance for Licensed Member Codes of Professional Conduct. This section has been shortened to remove all information that is intended for PEIs, rather than for potential registrants. A new link to the latest information is provided.
- n) Glossary. This has been extended to provide greater clarity on all terms used in UK-SPEC.

## **Competences update**

### **Overall approach**

- 4. Each competence was reviewed in detail, to ensure that the Standard is inclusive and achievable, particularly for earlier-career applicants, while maintaining the same level. New examples of evidence were drafted to support this aim. The main areas of enhancement are shown below.

### **Key changes**

- 5. Added clarity.
  - a) Clearer distinction is made between the requirements (the specification) and the examples that are intended as evidence to demonstrate competence. The 4<sup>th</sup> edition incorporates the following changes:
    - use of BSI standards language (for example: "shall" to denote a requirement that must be met)
    - separation of requirements and examples into different columns

- inclusion of new examples of evidence
  - inclusion of a description for each competence, intended to provide more information and to set the requirements of the competences in context
- b) Examples of evidence have been rewritten so that they are in the same style irrespective of whether they refer to EngTech, IEng or CEng. As a consequence, they are now more specific and consistent when referring to instructions, examples and definitions.
6. Greater inclusivity.
- a) Requirements are illustrated in a way that helps less experienced applicants draw out their relevant experience, as many younger engineers perceive that the requirements for CEng are pitched at a level which they have difficulty matching. As a result, some struggle to provide relevant evidence.
- Sub-competences are reworded; for example, C4 (CEng) from, 'bring about continuous improvement through quality management' to, 'bring about continuous improvement and promote best practice'.
  - The generic role description for CEng is revised; eg 'accountability for project, finance and personnel management' is replaced with 'responsibility for the financial and planning aspects of projects, sub-projects or tasks' and 'leadership and development of other professional staff through management, mentoring or coaching'. The term 'accountable' has been interpreted as having formal responsibility in an organisational context, eg a line manager or project manager. The changes in competence C attempt to better reflect the actual level of competence expected, based on current practice in professional review. The reality is that graduates of around 5 years will not be 'accountable' for project, finance or personnel management in any formal sense and will not be regarded by their employer as having this responsibility. This also makes it clear that the Standard can be met by those applicants who are operating with significant responsibility in matrix management structures.
  - Examples of evidence are revised to reflect realistic requirements.
- b) Technical specialism is as well recognised in the Standard as engineering management.
- Technical specialism is now recognised by changing, for example, C3 (CEng) from 'lead teams and develop staff' to, 'lead teams or technical specialisms'.
  - The examples of evidence have also been strengthened to include examples that are more accessible to academic applicants and technical specialists.
7. Greater clarity between IEng and CEng. The requirements for IEng and CEng have been clarified, specifically:
- Differentiation between IEng and CEng, principally at competences A and B. For example, A2 (CEng) emphasises technical complexity and level of risk.
  - Closer alignment between the requirements for competence C, recognising that the management/leadership requirements are more similar than they are different.

8. Reduced emphasis on technological innovation as the primary way to demonstrate the application of a high level of technical knowledge (CEng, A2). The definition of A2 has been broadened to emphasise complexity and level of risk: 'developing technology solutions to unusual or challenging problems using their knowledge and understanding and/or dealing with complex technical issues or situations with significant levels of risk...'
9. Greater emphasis on diversity and inclusion, which in the 3<sup>rd</sup> edition is only included in the requirements for EngTech (competence D2). This is now also included in IEng and CEng, as D3, 'demonstrate personal and social skills and awareness of diversity and inclusion issues'. For consistency with other categories of registration it is split out into a new competence for EngTech, (D3).
10. Help for applicants to provide evidence on meeting the requirements on ethics (competence E5). Rewording to help draw out applicants' understanding of ethical issues even if they have no clear-cut issue to describe.
  - Revised competence E5 for all levels of registration: '...understand the ethical issues that may arise in their role and carry out their responsibilities in an ethical manner'.
  - Revised examples of evidence that may be provided
11. Clarity on achievement of overall competence. In the consultations during the Standards Review, several pieces of feedback were received questioning the extent to which minor deficiencies in sub-competences can be allowed, or whether all competences (A1-E5) must be met. The following wording has been included:

A(n) Engineering Technician/Incorporated Engineer/Chartered Engineer must be able to demonstrate their competence in all of the areas listed, but the depth and extent of their experience and competence will vary with the nature and requirements of their role. They will demonstrate a level of competence and commitment in each area, (A1-E5), at a level which is consistent with their specific role. It is to be expected that they will have a higher level of competence in some areas than others and their role may provide limited experience in certain areas. However, they need to demonstrate an understanding of, and familiarity with, the key aspects of competence in those areas of limited experience as a minimum requirement while demonstrating higher levels of competence in those areas which are critical to their role. Overall, they will demonstrate an appropriate balance of competences to perform their role at Engineering Technician/Incorporated Engineer/Chartered Engineer level effectively.
12. Tables showing the changes for each category of registration are shown in Annexes A-C.

**Annex A: Key Changes (Engineering Technician)**

<b>Competence</b>	<b>UK-SPEC Third edition</b>	<b>UK-SPEC Fourth edition</b>
Preamble	<p>Engineering Technicians apply proven techniques and procedures to the solution of practical engineering problems.</p> <p>Engineering Technicians are required to apply safe systems of work and are able to demonstrate:</p> <ul style="list-style-type: none"> <li>• Evidence of their contribution to either the design, development, manufacture, commissioning, decommissioning, operation or maintenance of products, equipment, processes or services</li> <li>• Supervisory or technical responsibility</li> <li>• Effective interpersonal skills in communicating technical matters</li> <li>• Commitment to professional engineering values.</li> </ul>	<p>Engineering Technicians apply proven techniques and procedures to the solution of practical engineering problems.</p> <p>Engineering Technicians shall demonstrate:</p> <ul style="list-style-type: none"> <li>• Engineering knowledge and understanding to apply technical and practical skills</li> <li>• Evidence of their contribution to either the design, development, manufacture, commissioning, decommissioning, operation or maintenance of products, equipment, processes or services</li> <li>• Supervisory or technical responsibility</li> <li>• Effective interpersonal skills in communicating technical matters</li> <li>• The ability to operate in accordance with safe systems of work and to demonstrate appropriate understanding of the principles of sustainability</li> <li>• Commitment to professional engineering values.</li> </ul>
D1	Use oral, written and electronic methods for the communication in English of technical and other information.	Communicate effectively with others, at all levels, in English
D2	Work effectively with colleagues, clients, suppliers or the public, and be aware of the needs and concerns of others, especially where related to diversity and equality	Work effectively with colleagues, clients, suppliers or the public.
D3		Demonstrate personal and social skills and awareness of diversity and inclusion issues
E1	Comply with the Code of Conduct of your institution	Understand and comply with relevant codes of conduct

E2	Manage and apply safe systems of work	Understand the safety implications of their role and apply safe systems of work
E3	Undertake engineering work in a way that contributes to sustainable development	Understand the principles of sustainable development and apply them in their work
E5	Exercise responsibilities in an ethical manner	Understand the ethical issues that may arise in their role and carry out their responsibilities in an ethical manner.

## Annex B: Key Changes (Incorporated Engineer)

Competence	UK-SPEC third edition	UK-SPEC fourth edition
Preamble	<p>Incorporated Engineers maintain and manage applications of current and developing technology, and may undertake engineering design, development, manufacture, construction and operation.</p> <p>Incorporated Engineers are able to demonstrate:</p> <ul style="list-style-type: none"> <li>• The theoretical knowledge to solve problems in developed technologies using well proven analytical techniques</li> <li>• Successful application of their knowledge to deliver engineering projects or services using established technologies and methods</li> <li>• Responsibility for project and financial planning and management together with some responsibility for leading and developing other professional staff</li> <li>• Effective interpersonal skills in communicating technical matters</li> <li>• Commitment to professional engineering values</li> </ul>	<p>Incorporated Engineers maintain and manage applications of current and developing technology, and may undertake engineering design, development, manufacture, construction and operation.</p> <p>Incorporated Engineers shall demonstrate:</p> <ul style="list-style-type: none"> <li>• The theoretical knowledge to solve problems in developed technologies using well proven analytical techniques</li> <li>• Successful application of their knowledge to deliver engineering projects or services using established technologies and methods</li> <li>• Contribution to the financial and planning aspects of projects or tasks and to leading and developing other professional staff</li> <li>• Effective interpersonal skills in communicating technical matters</li> <li>• The ability to specify and operate to safe systems of work and to demonstrate appropriate consideration of the principles of sustainability</li> <li>• Commitment to professional engineering values.</li> </ul>
B3	Implement design solutions and contribute to their evaluation	Implement design solutions for equipment or processes and contribute to their evaluation.
C1	Plan for effective project implementation	Plan the work and resources needed to enable effective implementation of engineering tasks and projects
C2	Manage tasks, people and resources to plan and budget.	Manage (organise, direct and control), programme or schedule, budget and resource elements of engineering tasks or projects
C3	Manage teams and develop staff to meet changing technical and managerial needs	Manage teams, or the input of others, into own work and assist others to meet changing technical and management needs
C4	Manage continuous quality improvement	Take an active role in continuous quality improvement

D2	Present and discuss proposals	Clearly present and discuss proposals, justifications and conclusions
D3	Demonstrate personal and social skills.	Demonstrate personal and social skills and awareness of diversity and inclusion issues
E1	Comply with relevant codes of conduct	Understand and comply with relevant codes of conduct
E2	Manage and apply safe systems of work	Understand the safety implications of their role and manage, apply and improve safe systems of work.
E3	Undertake engineering work in a way that contributes to sustainable development.	Understand the principles of sustainable development and apply them in their work
E5	Exercise responsibilities in an ethical manner.	Understand the ethical issues that may arise in their role and carry out their responsibilities in an ethical manner



### Annex C: Key Changes (Chartered Engineer)

Competence	UK-SPEC third edition	UK-SPEC fourth edition
Preamble	<p>Chartered Engineers develop solutions to engineering problems using new or existing technologies, through innovation, creativity and change and/or they may have technical accountability for complex systems with significant levels of risk.</p> <p>Chartered Engineers are able to demonstrate:</p> <ul style="list-style-type: none"> <li>• The theoretical knowledge to solve problems in new technologies and develop new analytical techniques</li> <li>• Successful application of the knowledge to deliver innovative products and services and/or take technical responsibility for complex engineering systems</li> <li>• Accountability for project, finance and personnel management and managing trade-offs between technical and socio-economic factors</li> <li>• Skill sets necessary to develop other technical staff</li> <li>• Effective interpersonal skills in communicating technical matters.</li> <li>• Commitment to professional engineering values.</li> </ul>	<p>Chartered Engineers develop solutions to complex engineering problems using new or existing technologies, and through innovation, creativity and technical analysis.</p> <p>Chartered Engineers shall demonstrate:</p> <ul style="list-style-type: none"> <li>• The theoretical knowledge to solve problems in new and established technologies and to develop new analytical techniques</li> <li>• Successful application of the knowledge to deliver innovative products and services and/or taking technical responsibility for complex engineering systems</li> <li>• Responsibility for the financial and planning aspects of projects, sub-projects or tasks</li> <li>• Leadership and development of other professional staff through management, mentoring or coaching</li> <li>• Effective interpersonal skills in communicating technical matters</li> <li>• Understanding of the safety and sustainability implications of their work, seeking to improve aspects where feasible</li> <li>• Commitment to professional engineering values</li> </ul>
A1	Maintain and extend a sound theoretical approach in enabling the introduction and exploitation of new and advancing technology	Have maintained and extended a sound theoretical approach to enable them to develop their particular role
A2	Engage in the creative and innovative development of engineering technology and continuous improvement systems	Are developing technological solutions to unusual or challenging problems, using their knowledge and understanding and/or dealing with complex technical issues or situations with significant levels of risk

B1	Identify potential projects and opportunities	Take an active role in the identification and definition of project requirements, problems and opportunities
B2	Conduct appropriate research, and undertake design and development of engineering solutions	Can identify the appropriate investigations and research needed to undertake the design, development and analysis required to complete an engineering task and conduct these activities effectively
B3	Manage implementation of design solutions, and evaluate their effectiveness.	Can implement engineering tasks and evaluate the effectiveness of engineering solutions
C1	Plan for effective project implementation	Plan the work and resources needed to enable effective implementation of a significant engineering task or project
C2	Plan, budget, organise, direct and control tasks, people and resources	Manage (organise, direct and control), programme or schedule, budget and resource elements of a significant engineering task or project
C3	Lead teams and develop staff to meet changing technical and managerial needs.	Lead teams or technical specialisms and assist others to meet changing technical and managerial needs
C4	Bring about continuous improvement through quality management	Bring about continuous quality improvement and promote best practice
D2	Present and discuss proposals	Clearly present and discuss proposals, justifications and conclusions
D3	Demonstrate personal and social skills.	Demonstrate personal and social skills and awareness of diversity and inclusion issues
E1	Comply with relevant codes of conduct	Understand and comply with relevant codes of conduct
E2	Manage and apply safe systems of work	Understand the safety implications of their role and manage, apply and improve safe systems of work.
E3	Undertake engineering work in a way that contributes to sustainable development.	Understand the principles of sustainable development and apply them in their work
E5	Exercise responsibilities in an ethical manner.	Understand the ethical issues that may arise in their role and carry out their responsibilities in an ethical manner