# Introduction

Applicants who aspire to registration but do not have Recognised Qualifications (accredited Masters degree for CEng and Batchelors degree for IEng) may demonstrate the required knowledge and understanding in other ways but must clearly demonstrate they have achieved the same level of knowledge and understanding as those with recognised qualifications. Ways to demonstrate this include:

* Further qualifications, in whole or in part, to match the recognised qualification level standards.
* Writing a technical report, based on their experience, and demonstrating their knowledge and understanding of engineering principles within the corrosion industry.
* Completing appropriate work-based experiential learning or further learning to develop experience in roles that expand corrosion related technical knowledge, and record the learning

This paper describes the processes used by ICorr to take applicants forward for registration through the individual assessment route via the experiential learning route for CEng/IEng

# Work-based experiential learning

Work-based experiential learning means the knowledge and understanding that has been developed through experience. Learning occurs over time as new knowledge and understanding updates and builds on a previous level of understanding. Learning does not occur by simply listing experiences, but by researching, identifying new knowledge and then by reflecting on experience and drawing from the knowledge of others to increase understanding. In an educational context, this might involve formalised research activities. Most major employers within the corrosion industry offer a range of sources of knowledge, including experienced colleagues or specialists acting as mentors or coaches. The term work-based learning does not imply that learning occurs only at work, but that the knowledge and understanding that have developed are applied and challenged through work practice within the corrosion industry.

Examples of applicants who might have appropriate work-based experiential learning may include:

* Candidates, who are practising to the same standard as a professionally registered engineer in the corrosion industry, but do not hold formal qualifications at the right level:
* Candidates, who have had the opportunity, through practice, to develop knowledge and understanding, and are able to provide technical evidence from work-based learning experience within the corrosion industry:
* Candidates, who demonstrate sufficient achievement in a technical role within the corrosion industry, appropriate to the category of registration being applied for.

# Evidence of work-based experiential learning

ICorr does not mandate how evidence of work-based experiential learning should be provided but suggests that the following methods/format might be suitable:

* An extended curriculum vitae; plus
* An existing technical report written in the course of work, based on, for example, an investigation, design study or a feasibility report, which might include individual research and study into engineering and/or technology techniques; or
* A portfolio relating to one or two projects, together with a linking commentary, e.g. a collection of data or records, which would need to be tied together by an aim, an outcome and a rationale; and
* A copy of a technical presentation that has been given, which best gives examples of technical learning.

All evidence provided must indicate the applicants role and responsibility and not just being a team member,

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# Standards of Evidence

The UK-SPEC 4th Edition recognised qualifications are in engineering or technology; therefore in any demonstration of equivalence it is **the engineering knowledge, skills and understanding**, as opposed to the engineering management, which will be the focus of the assessment.

The totality of the evidence presented by the candidate should show that they have obtained the right levels of underpinning knowledge, engineering analysis and design awareness, namely:

**Chartered Engineer**

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| --- | --- | --- | --- | --- | --- |
| |  | | --- | | **1. Underpinning science and mathematics and corrosion engineering disciplines, will normally include:** | | 1. understanding of the scientific/engineering principles of the candidates own specialisation and related disciplines. | | 1. awareness of developing technologies related to your own specialism. | | 1. knowledge and understanding of mathematical and computer models relevant to corrosion engineering and an appreciation of their limitations. | | 1. understanding a wide range of concepts, including some outside engineering, and the ability to apply them in engineering projects. | |
| |  | | --- | | **2. Engineering analysis, will normally include:** | | 1. ability to use fundamental knowledge to investigate new and emerging technologies. | | 1. ability to apply mathematical and computer-based models for solving problems in engineering, and the ability to assess the limitations of particular cases. | | 1. ability to extract data pertinent to an unfamiliar problem, and apply solutions using computer-based engineering tools where appropriate. | |
| |  | | --- | | **3. Design awareness, will normally include:** | | 1. knowledge and understanding of design processes and methodologies and the ability to apply and adapt them in unfamiliar situations. | | 1. ability to generate an innovative solutions for products, systems, components or processes to fulfil new needs. | |

**Incorporated Engineer**

|  |  |  |  |
| --- | --- | --- | --- |
| |  | | --- | | **1. Underpinning science and mathematics and associated corrosion engineering disciplines, will normally include:** | | 1. knowledge and understanding of the scientific principles underpinning relevant current technologies, and their evolution. | | 1. knowledge and understanding of mathematics necessary to support application of key engineering principles. | |
| |  | | --- | | **2. Engineering analysis, will normally include:** | | 1. ability to monitor, interpret and apply the results of analysis and modelling in order to bring about continuous improvement. | | 1. ability to apply quantitative methods and computer software relevant to corroson engineering, frequently within a multidisciplinary context. | | 1. ability to use the results of analysis to solve engineering problems, apply technology and implement engineering processes. | | 1. ability to apply a systems approach to engineering problems through know-how of the application of the relevant technologies. | |

# Assessment of work-based experiential learning

Assessment will be made by Members the SOE Membership Committee, based on the evidence provided by the candidate, which should be sufficient to demonstrate how work-based experiential learning has enabled them to reach the same level of knowledge and understanding as those possessing the recognised qualifications (which have appropriate Quality Assurance Agency (for Higher Education) descriptors) as required by the Engineering Council’s UK-SPEC.

Quality Assurance Agency (for Higher Education) descriptors

The following are examples of the types of evidence and assessment indicators that ICorr/SOE are looking for in order to demonstrate compliance with both UK-SPEC and the generic Quality Assurance Agency (for Higher Education) descriptors for a typical MEng or BEng degree holder:

# Chartered Engineers - evidence and assessment indicators

a) Areas of underpinning knowledge and how they have been developed. Include details of technical development from academic and industrial training and experience.

In this section you are being asked to describe the level of your underpinning knowledge (e.g. HNC, HND, degree, etc). It is not sufficient to simply provide a list of any academic programmes. You are also expected to demonstrate how your underpinning knowledge has been developed through the course of your work. Evidence of how you have extended your own technological capability is also required. This may be evidenced by how you identify constraints and exploit opportunities for the development and transfer of technology within your chosen field. Evidence could also include how you have secured any intellectual property rights and how you develop and evaluate continuous improvement systems.

b) How you deal with complex issues, both systematically and creatively; make sound judgements in the absence of complete data and communicate your conclusions clearly to specialist and non-specialist audiences.

This section relates to the application of your underpinning knowledge. In addition to explaining how you apply your knowledge, you should also provide examples that demonstrate your ability in the areas described above. Dealing with complex issues, both systematically and creatively requires you to demonstrate how you identify and agree appropriate research methodologies, and how you assemble the necessary resources. You should refer to how you collect, analyse, and evaluate the relevant/available data and how you then draft, present and agree your findings.

The ability to demonstrate effective interpersonal skills is part of the Professional Review & Interview Process. Communicating your conclusions clearly to specialist and non-specialist audiences could be evidenced by examples of your providing advice to technical and non-technical colleagues.

c) Self-direction and originality in tackling and solving problems, and the ability to act autonomously in planning and implementing tasks at professional or equivalent level.

In this section it is vital that you clearly demonstrate your personal responsibility. You may be a team leader, but this section requires you to sell yourself and your achievements, rather than those of the team. Examples could include how you have reviewed the potential for enhancing engineering products, processes, systems and services and how you have explored the territory within your own responsibilities for new opportunities.

d) How you intend to continue to advance your knowledge and understanding and to develop new skills to a high level.

Being able to demonstrate a commitment to continuing professional development (CPD) is a vital part of the Professional Review & Interview process for CEng registration. This section of the form requires you to identify the limits of your own personal knowledge and skills, to confirm how you intend to address any deficiency. Evidence could include further study, such as Open University (or other) CPD programmes, an IT course, or broadening and deepening your own knowledge base through research and experimentation.

e) The qualities and transferable skills necessary for employment; the exercise of initiative and personal responsibility, decision-making in complex and unpredictable situations, the independent learning ability required for continuing professional development.

Chartered Engineers need to be well-rounded individuals who are able to adapt to various situations. As with section c), this section requires you to provide personal examples. Evidence could include how you identified the required cost, quality, safety, reliability, appearance, fitness for purpose and environmental impact of an engineering design. Your independent learning ability could be evidenced by demonstrating how you have actively learned from feedback on results to improve future design solutions and build best practice. The exercise of initiative and personal responsibility could be evidenced by how you have identified projects and opportunities.

# Incorporated Engineers - evidence and assessment indicators

a) Areas of underpinning knowledge and how they have been developed. Include details of technical development from academic and industrial training and experience.

In this section you are being asked to describe the level of your underpinning knowledge (e.g. HNC, HND, Degree Etc). It is not sufficient to simply provide a list of any academic programmes; you are also expected to demonstrate how your underpinning knowledge has been developed through the course of your work. Evidence of how you have extended your own technological capability is also required. This may be evidenced by how you identify constraints and exploit opportunities for the development and transfer of technology within your chosen field. Evidence would include how you have identified and studied new developments and technologies within your field.

b) How you deal with complex projects, both systematically and practically; make sound judgements in the absence of complete data and communicate your conclusions clearly to specialist and non-specialist audiences.

This section relates to the application of your underpinning knowledge. In addition to explaining how you apply your knowledge, you should also provide examples that demonstrate your ability in the areas described above. Dealing with projects, both systematically and practically requires you to demonstrate how you identify and agree appropriate analysis methodologies, and how you assemble the necessary resources. You should refer to how you review and consolidate relevant data and information to frame assumptions and have arguments to critically evaluate to achieve a solution or a range of solutions to a problem. The ability to demonstrate effective interpersonal skills is part of the Professional Review & Interview Process. Communicating your conclusions clearly to specialist and non-specialist audiences could be evidenced by examples of your providing information, ideas, problems and solutions to technical and non-technical colleagues.

c). Self-direction and decision making in tackling and solving problems, and the ability to show initiative in completing tasks at professional or equivalent level.

In this section it is vital that you clearly demonstrate your personal responsibility. You may be a team leader, but this section requires you to sell yourself and your achievements, rather than those of the team. Examples could include how you have implemented new engineering products, processes, systems and services and how you have reviewed new developments and opportunities within your own area of responsibility.

d) How you intend to continue to advance your knowledge and understanding and to develop new skills to a high level.

Being able to demonstrate a commitment to continuing professional development (CPD) is a vital part of the Professional Review & Interview process for IEng registration. This section of the form requires you to identify the limits of your own personal knowledge and skills, to confirm how you intend to address any deficiency. Evidence could include further study, such as training programmes, CPD programmes and IT Courses or broadening your own knowledge base through the study and appraisal of current research or technological development programmes.

5. The qualities and transferable skills necessary for employment; the exercise of initiative and personal responsibility, decision-making in complex and unpredictable situations, the learning ability required for continuing professional training and development.

Incorporated Engineers need to be well-rounded individuals who are able to adapt to various situations. As with section 3, this section requires you to provide personal examples. Evidence could include how you identified the required cost, quality, safety, reliability, appearance, fitness for purpose and environmental impact of an engineering design or project. Your independent learning ability could be evidenced by demonstrating how you have actively learned from feedback on results to improve future projects and promote best practice. The exercise of initiative and personal responsibility could be evidenced by how you have identified projects and opportunities.

# Overall assessment of candidates for registration through the Experiential Learning Route

SOE will assess all evidence provided by the candidate, including any work-based experiential learning, in the context of the overall application review process and will make a decision on whether or not to proceed to PRI on the following basis:

If the candidate has demonstrated that they have developed and exercised the required knowledge and understanding, the application process may proceed directly to PRI. The interviewers may probe specific competences in more detail.

If the candidate has made a reasonable case, but there remain questions about certain aspects of their technical knowledge and understanding, then the candidate may be invited to attend a Technical Interview which will be carried out prior to and separately from the PRI, but which may be conducted back to back on the same day as the PRI, depending on the results of the Technical Interview. Candidates, who are asked to attend a Technical Interview, will need to satisfy the technical interviewers that they have gained the appropriate overall level of underpinning knowledge and understanding before they could be successful at PRI.

If the candidate has not demonstrated the required level of knowledge and understanding, the application process will not proceed to PRI and the candidate will be advised of the best way forward to achieve such competencies to undertake a PRI at some stage in the future.

**CEng/IEng Application**

Experiential Learning Route agreed

**Engineering Council Registration**

(if successful at the PRI)

**Professional Review Interview**

(if successful at the Technical Interview)

**Technical Interview** (if required)

**Review of Experiential Learning** evidence by academic Panel. If approved, candidate will be invited to interview

**Candidate asked to forward appropriate**

Experiential Learning evidence

(extended CV, existing technical report, etc.)