Competence and Commitment (C&C) Report guidance

Led by members, supporting members, serving society
This guidance document contains information to help you complete and submit your Competence and Commitment (C&C) Report as part of your application for Chartered Member. Additional information including example reports can be found at www.icheme.org/chartered

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General information and guidance

IChemE requires everyone applying to become a Chartered Chemical Engineer to submit a Competence and Commitment (C&C) report. This report is used to assess your professional experience in the practical application of chemical engineering against the minimum required level for a Chartered Member of IChemE, and that you’re committed to the profession and your continuing development as an engineer. As a guide, your report should be approximately 3000 words in total, and no more than 20% over.

Report writing

Your report will be assessed by Chartered Members and Fellows of IChemE who volunteer their time to uphold the standards of the institution and support the professional development of members.

Please complete your report in accordance with these guidelines and provide evidence from your professional practice that you meet the requirements for Chartered membership. This will help IChemE to use the valuable time of volunteer assessors effectively and to obtain a decision on your application as soon as possible.

- IChemE expects reports to be well written and concise. Please complete your report within the word count and in clear, correct English
- make sure your report accurately reflects your own experience
- avoid using acronyms, unless defined in full when first appearing in the report or in a glossary
- ensure that you can discuss the work described in your report in further depth at interview

Personal role

Within each section, you should identify the most appropriate examples from your own career that best reflect your chemical engineering experience.

Be specific when describing your individual role in, and contribution to, a piece of work. The Chartered Chemical Engineer qualification is awarded based on your own chemical engineering competence, and not on the success of a project or organisation.

Responsibility

The experience cited in your C&C report should demonstrate that you are professionally responsible for the consequences of your technical judgements and decisions. It is understood that in your early career you will probably be under close supervision, but as you prepare to apply for Chartered status there should be a progression towards increased responsibility. You do not need management experience, but work activities showing some (or all) of the following features suggest a suitable level of responsibility:

- you show a proactive approach and use your initiative
- take ownership of an area of work or project
- colleagues rely on your engineering judgement or advice on chemical engineering aspects
- budgetary accountability

Your C&C report should focus primarily on your career post-graduation, whether in industry or academia. However, you may include appropriate evidence from an industrial placement, or experience gained in long term employment during your undergraduate studies, if it involved a professional level of responsibility.
Competence (sections A–C)

The primary requirement within the first three sections of the C&C report is to demonstrate that your personal experience has translated into chemical engineering competence. You may reference formal training as well as work-based learning and you should refer to the chemical engineering principles that back up your work where relevant. You should aim to write 100–200 words maximum in each sub-section.

Depth

Ensure that you provide adequate technical detail in sections A–C. Consider the following model:

- context – provide brief detail about the circumstances of the work you are describing
- action – detail the actions you took
- result – describe the outcomes, whether successful or otherwise, or still pending

We recommend that for each sub-section, you provide one appropriate example in which you go into full technical depth, as well as providing a few brief examples (in bullet point format if wished), to show application in other, different instances.

Breadth

Through the examples that you provide in sections A–C, you should show that that you have had a broad range of experience. The table below covers what IChemE believes to be a comprehensive overview of the varied technical areas of chemical engineering practice. These apply to both industrial and academic environments and include practical applications within post-graduate study.

As long as you can demonstrate that you are employing chemical engineering principles and can provide evidence appropriate to each section, the IChemE assessment process is designed to value and assess your experience on equal merit - whatever your particular career path.

Within your C&C report, we would expect you to match your experience across four to six of these areas:

<table>
<thead>
<tr>
<th>Process plant operation</th>
<th>Legislation, regulation</th>
<th>Computer application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of products, services</td>
<td>Project management, administration</td>
<td>Teaching, managing, training</td>
</tr>
<tr>
<td>Instrumentation &amp; control</td>
<td>Quality &amp; assurance</td>
<td>Technical/economic evaluation</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Economic accountancy, cost estimation</td>
<td>Technical sales, marketing, contracts</td>
</tr>
<tr>
<td>Health, safety, risk aspects</td>
<td>Design of process, plant &amp; equipment</td>
<td>Sustainability &amp; environmental aspects</td>
</tr>
</tbody>
</table>
**Commitment (sections D–E)**

Sections D and E require you to write a narrative demonstrating to the assessor that you are committed to high standards of professional and ethical conduct and recognise obligations to society, the profession and the environment. You’re required to maintain your professional development and competence and keep your knowledge up-to-date as a consolidated part of your professional duties. Each of these sections underlines a key factor of the Chartered Chemical Engineer qualification and you should give due consideration to their completion.

**Confidentiality**

Use the C&C report to demonstrate to IChemE that your individual competence meets the minimum level expected of a Chartered Chemical Engineer. The assessors need to understand the technical aspects of your work and the engineering challenges involved. You should be specific about what you did, but you’re not required to disclose confidential information contrary to your employer’s confidentiality policy.

**Competence and commitment report checklist**

Before submitting, please consider whether you have met all of the points below:

<table>
<thead>
<tr>
<th>Practical application</th>
<th></th>
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<tbody>
<tr>
<td>Relevant theory</td>
<td></td>
</tr>
<tr>
<td>Responsibility</td>
<td></td>
</tr>
<tr>
<td>Personal contribution (I did…)</td>
<td></td>
</tr>
<tr>
<td>Skills and experience (not time)</td>
<td></td>
</tr>
<tr>
<td>Technical depth</td>
<td></td>
</tr>
<tr>
<td>Breadth (four to six technical areas)</td>
<td></td>
</tr>
<tr>
<td>Word count (cut superfluous information)</td>
<td></td>
</tr>
<tr>
<td>Spelling/typos</td>
<td></td>
</tr>
<tr>
<td>Verification</td>
<td></td>
</tr>
</tbody>
</table>
Section A: application of knowledge

Provide evidence of your ability to apply knowledge and understanding of engineering or science to practical chemical engineering situations.

The examples provided must involve the use of chemical engineering principles and knowledge. Having an awareness of methodologies, the use of standard formulae or data entry into standard spreadsheets of other models, without an apparent understanding of the underlying chemical engineering principles, does not demonstrate adequate experience.

Ai. Identifying or defining a problem, opportunity or project

How are you proactive in anticipating problems in your work and how do you subsequently go about overcoming these problems or finding solutions? Please make reference to particular calculations, research, analysis modelling etc you may have used in your work (you do not have to include workings or appendices).

Examples:
- designing experiments to study heat transfer rates in a fluidised bed combustion chamber
- selecting design codes for a vacuum vessel and pipework
- specifying process and equipment modifications to update a pharmaceutical water system
- identifying thermal cycling problems and developing an improved control system

You might write:

I calculated the rate of evaporation from concrete impregnated by a very low volatility substance of high odour characteristics to estimate how long a smell would persist...

Aii. Combining ideas and contributions of different people and disciplines

Convey your ability to obtain information from an interdisciplinary team, whether that includes other engineers, scientists, technical sales or marketing professionals. How do you use the skills and knowledge of others to arrive at an outcome you wouldn’t be able to achieve individually?

Examples:
- obtaining data from a multidisciplinary team of chemists, biologists and controls engineers to solve a fermentation problem in protein packaging
- providing a key contribution to a team of chemists, engineers and operators to commission an automatic chemical analysis system
- consulting reservoir engineers to obtain operating forecasts for process design
You might write:

I am responsible for coordinating information from geologists and petrophysicists to develop a cost effective and optimised well design...

Aiii. Creativity and innovation: developing your own ideas to produce new solutions, designs and technological approaches

How do you go about making improvements/modifications in your work? Innovation is relevant at any level providing you are advancing either a process or equipment in some way, be it reducing cost, improving efficiency, increasing safety aspects etc. You are not expected to be registering your own patents or inventing new formulae. Refer to specific outputs of your work, for example; preparation of front-end design documents, material and energy balances, process flow diagrams (PFD), outline equipment specifications.

Examples:
- developing new commercial standard design software for gas absorption processes
- developing new materials for artificial organs
- commercialising a novel consumer washing powder at production scale
- recommending and installing advanced process control to improve plant performance

You might write:

I found a new approach in the technical literature to a long-standing problem and investigated how to apply this...

Aiv. Scientific or technical evaluation and optimisation (of product, process, equipment, method, project etc against the requirements you identified, or the brief you were given)

How do you ensure your solutions are safe and feasible before you implement them? If you have had access to data from a processing operation, explain in this section how the materials being processed behave in practice.

Examples:
- corrosion testing of column packing material
- carrying out sludge dewatering trials to select the most appropriate processes
- evaluating alternative control schemes for a pasteuriser using a simulation system
- assessment of the effect of a raw material quality on plant performance
You might write:

*I measured flow and concentrations to produce a mass balance for identifying, then reducing materials losses...*

Av. Planning and execution of projects: organising or performing technical work to implement or validate solutions, designs etc.

How do you contribute to the delivery of projects? Ideally, a few years into your career you should look to lead on a small project to gain experience of working on every stage, eg from planning and research, to development and implementation to manufacture or marketing and sales etc.

Examples:

In this section you will likely need to consider commercial aspects.

- devising changeover procedures to convert to new control hardware
- commissioning an acid plant conversion section and comparison with designs
- programming and supervising the erection of a new clean room manufacturing facility
- developing piping & instrumentation diagrams (P&IDs) for new projects

You might write:

*I benchmarked performance of similar plants and identified where and how the best performed better than the others...*

Section B: evidence that you can handle the wider implications of your work as an engineer

Demonstrate your awareness of the safety, environmental and commercial implications of your work. Developing awareness does not mean that you need expert experience working as a safety engineer, environmental consultant or project manager – these issues should be inherent in the work of any chemical engineer.

Bi. Ability to handle health, hazard and safety aspects: to apply appropriate principles, good practice, meet legislative requirements etc.

Give direct examples that describe your contribution to ensuring safety and health in process operations (which may include laboratories). This section is a critical requirement for successful application for Chartered Chemical Engineer status. In particular you need to show experience of structured process hazard identification.
Examples:

- participating in a Hazard and Operability (HAZOP) study
- auditing safety compliance of a pilot plant used for teaching in a university
- designing or evaluating pressure relief, emergency flare and fire-fighting systems
- carrying out an investigation into a boiler explosion

You might write:

*I prepared a safe working procedure (SWP) for an unusual maintenance task...*

**Bii. Ability to handle sustainability aspects: ie environmental, public concern and other societal issues, recognition of risks etc.**

Demonstrate your understanding of how operations may have an environmental or societal impact and show how you incorporate recognition and remediation of these risks into your work.

Examples:

- investigating the bio-remediation of contaminated soil
- preparing environmental impact assessment documents for a solvent plant
- implementing and monitoring an ISO14000 environmental management system at an oil refinery
- analysis and investigation of ways of reducing energy use

You might write:

*I ensured that plant emissions controls complied with best available technology...*

**Biii. Ability to handle commercial and economic aspects**

Show how you have contributed, as an engineer, to commercial decisions.

Examples:

- devising a spreadsheet to optimise refinery product mix schedules based on market price data
- estimating capital and operating costs for alternative designs
- carrying out an insurance risk assessment for a novel manufacturing process
- assessing the cost implication of loss of yield versus shut down costs for cleaning

You might write:

*I set out the cost and non-cost implications of introducing a further production line on site...*
Section C: interpersonal, leadership & communication skills

Convey how you effectively communicate and work with professionals at all levels. How do you ensure your colleagues know what you are doing and how do you gather information on issues concerning you?

Ci. Managing interpersonal relationships

How does the development of professional relationships impact on your ability to do your job successfully? Evidence of liaising with external clients, suppliers and organisations should also be considered.

Examples:

- resolving conflicts and create, maintain and enhance productive working relationships
- negotiating contractual arrangements with other stakeholders (client, subcontractors, suppliers etc)
- communicating operating plans with production staff

You might write:

*I promoted a project aimed at continuous improvement within a staff group...*

Cii. Demonstrating leadership in a professional role

You do not necessarily have to be the manager of a team of engineers to demonstrate leadership. Candidates on a quality graduate training scheme (with IChemE accreditation for instance) should be eligible to apply before the age of 30 and many will not have had experience managing their peers or leading teams.

Think of other ways you demonstrate leadership, for example working pro-actively as an individual eg initiating projects, delegating work, training your peers, providing direction to operators or technicians.

Examples:

- ensuring that variations from quality standards, programme and budgets are identified and that corrective action is taken
- agreeing objectives and work plans with teams and individuals
- leading and supporting team and individual development
- leading a technical review

You might write:

*I provided leadership for an ‘Open Day’...*

Ciii. Communicating ideas and plans by report writing and oral presentation
You should give evidence here of presenting technical data orally and writing reports about your findings. Work completed for a PhD, EngD or other academic research may be relevant.

**Examples:**

- writing a user requirement specification (URS) for a control system
- writing screen displays for an acid plant conversion to computer control
- provision of technical guidelines to assist in product selection
- presenting alternative design options to senior management

**You might write:**

*I devised a slideshow of the implications to the plant of a new product variant, which was specifically tailored to different senior managers’ interests…*

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**Section D: show your commitment to high standards of professional and ethical conduct**

Demonstrate a personal commitment to professional standards, recognising obligations to society, the profession and the environment.

**Di. Professional conduct**

Demonstrate your commitment to ensuring that your work is of the highest possible standard and that you seek continuous improvement and advancement in your work, both as an individual and by engaging and participating with the wider profession.

**You may wish to consider:**

- adherence to your organisation or company quality management system and its approved procedures
- awareness and compliance with relevant code of conduct to your work
- professional activities over and above your core role
- mentoring or encouraging others to maintain competence

**You might write:**

*I am active within my local members group and have organised various technical seminars on the subject of (...) to help others gain an understanding of this field.*

*I have volunteered in my community to promote engineering to school children with the aim of securing the next generation of chemical engineers.*

*I have trained younger engineers in … as part of an ongoing scheme to ensure competence across my company.*

**Dii. Ethical decision making**
Give direct examples which illustrate your personal and ethical commitment of working to professional standards laid out by IChemE, your company or organisation, and of the wider community.

You may wish to consider:

- the IChemE Code of Ethics and the Statement of Ethical Principles; how this impacts on your behaviour and influences your decision making
- issues of confidentiality
- avoiding conflict of interest

You might write:

I faced a professional dilemma when my company secured a contract with my previous employer, so I ....(your response)

I noticed a potential hazard that was outside of my core area, but recognised my ethical responsibility and reported it through appropriate mechanism...

Section E: continuing professional development

In this section you should outline, within approximately 500 words, your recent development and short to medium term development plans. You should also describe the received and potential benefits associated with these goals. You will also need to describe how you identify and plan your CPD, and how you record activities carried out.

Ei. Report of recent CPD already undertaken

| Briefly describe the methods and tools you use record your CPD activities | Give an explanation of how and where you maintain your record of CPD activities undertaken. You should also indicate what types of activity you record and what other information you record. See IChemE’s website for more information. |

| Describe the significant CPD activities you have carried out in the last 12 months | For each activity listed, describe the purpose/objective of carrying it out and the benefits you gained from it. |

Provide a list of the significant CPD activities you have undertaken in the last 12 months. These would normally include activities from the broad range of CPD activity types (training courses, work based (on the job), academic learning, volunteering, events/seminars and self-study etc.)

For each item listed in the adjacent column, please give a brief description of the purpose/objective that lay behind the activity being performed, and what key benefits you gained by carrying it out.
### Eii. Future CPD Plan

<table>
<thead>
<tr>
<th>Briefly describe the method and approach/tools that you use to identify your CPD development objectives, and how they are turned into an actionable plan.</th>
<th>Give a brief outline of the process/steps you follow to create your CPD objectives. You should include as appropriate (a) how your CPD needs are identified and prioritised, (b) how and with whom they are agreed (if required), and (c) how those objectives are then turned into a plan which can be put into action. This process will vary depending on your own personal circumstances and may refer to your employer's annual development review process and tools. Where appropriate, links to longer-term career plans should be included.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Describe the development objectives that you have identified to be addressed in the next 12-18 months and the purpose of each one</th>
<th>For each objective listed, describe the what activities you plan to carry out to achieve them and the expected timescale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Give a brief description of the key development objectives that you have identified for the next 12-18 months, and why those particular ones were chosen.</td>
<td>For each objective in the adjacent column, please provide brief details of the activities you will undertake to complete each one and give an indicative timescale for each objective.</td>
</tr>
</tbody>
</table>

Consider your technical development, as well as your broader professional skills. Show that you are proactive in seeking development opportunities and specify the time scale involved and the intended outcome(s).

### CPD: further information

**What is CPD?**

The challenges and opportunities of experience at work will provide the central method for your continuing professional development, however you may support this with formal/structured activities.

When planning and recording CPD consider:

1. **Demonstration of commitment to maintaining competence:**
   - understanding of the use of evidence in your recruitment/employment/appraisals
- updating particular areas of technical competence, so that your practice is fully in line with current professional and legal/commercial requirements
- development of interpersonal and management skills (also known as transferable skills)
- broadening of experience leading to new career opportunities

2. Self-management

- identifying and prioritising development needs and opportunities
- using appropriate guidelines and competence benchmarks
- planning and carrying out development action using a range of appropriate learning opportunities
- recording useful sources, development achievements and forms of evidence
- evaluating achievements and reviewing against needs

IChemE does not issue guidance on the specific CPD members should undertake as this must be driven by the most appropriate development for the role, sector and career stage.

Methods of CPD include:

- external courses including distance learning
- in company training/in-house courses
- work-based learning, eg codes observed, conflicts resolved
- shadowing
- preparation and delivery of lectures and presentations
- research/publishing
- attendance at lectures, seminars, conferences, webinars
- secondment and special projects
- moving department
- moving sector
- coaching, tutoring, monitoring, teaching
- self-directed private study
- relevant voluntary work

More information about continuing professional development including IChemE’s CPD Policy and revalidation requirements for membership grades and professional registrations can be found at [www.iche.org/membership](http://www.iche.org/membership)
Verification

As part of the application and assessment process, we require that the experience cited in your C&C report is verified as a true account by another individual(s). The person(s) verifying your experience should have been:

- in a senior position to you at the time of the work referenced and
- familiar with the work you were doing at the time

They do not have to be:

- a member of IChemE
- Chartered
- a chemical engineer
- your referee
- your manager now
- in the same country as you

If one person can vouch for all of the training and experience cited in your C&C report, please ask them to sign the end of your report and provide their professional qualifications (if relevant) and their relationship to you. If more than one person is required to verify, you should ask them to indicate in the relevant boxes, which sections they attest on your behalf, and sign as before. We will also accept electronic verification if your verifier cannot sign the report in person.

If more than 20% of your report cannot be verified, please send a covering letter explaining why. For example, if you have lost contact with the individual concerned. Please expect this section to be discussed more thoroughly in your interview.
Chartered Member (MIChemE) review process

Additional information

Further guidance including report examples can be found at www.icheme.org/chartered

If you have any questions or need further information contact members@icheme.org
Led by members, supporting members, serving society

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