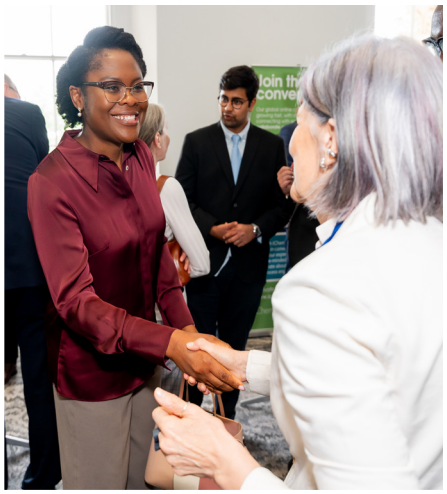
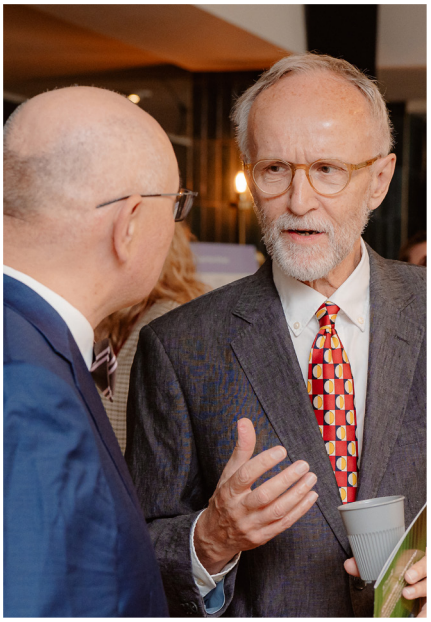
IChemE

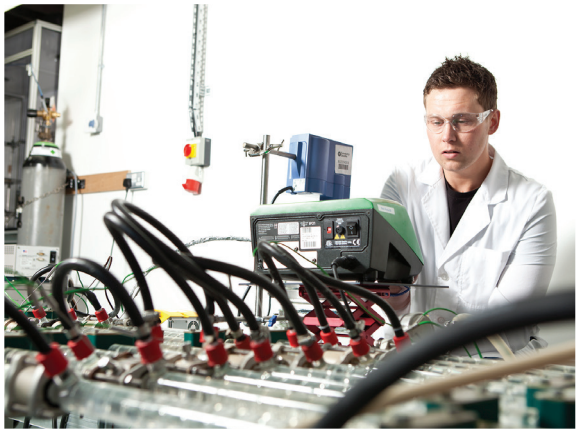
Institution of
Chemical Engineers

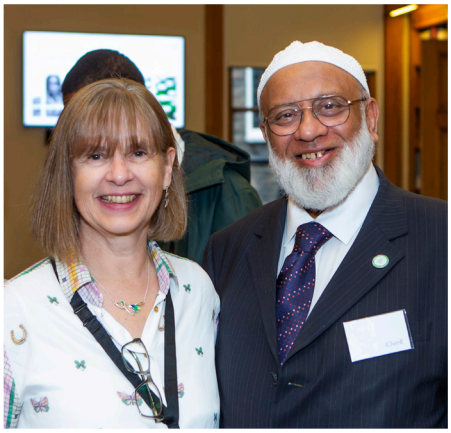
IChemE Engineering Technician (EngTech) and Technician membership (TIChemE)

Information and guidance for applicants









Contents

1 Purpose of this guidance

This guidance is designed to help you complete your application for Engineering Technician (EngTech) registration and Technician Membership (TIChemE) with IChemE.

It explains:

- what EngTech registration recognises
- how to complete each section of the application form
- what professional reviewers look for at EngTech level
- how to present clear, relevant evidence from your own work

This document should be read alongside the *EngTech/TIChemE application form* and IChemE's *general guidance on professional registration*.

2 What EngTech registration recognises

EngTech registration recognises engineering technicians who:

- apply established techniques and procedures
- work safely, responsibly and ethically
- contribute to the operation, maintenance, installation, testing, commissioning or improvement of engineering systems, processes or equipment
- take responsibility for their own work and, where appropriate, guide or supervise others

You are not expected to demonstrate:

- complex theoretical analysis
- original or chartered-level design authority
- senior management or strategic leadership

EngTech applicants typically demonstrate:

- practical engineering knowledge and understanding;
  - contribution to design, development, operation or maintenance activities
- supervisory or technical responsibility appropriate to their role
- effective communication and interpersonal skills
- safe working practices and awareness of sustainability
- commitment to professional conduct and values.

Applicants should show a balanced range of competences across A1–E5. It is normal to have stronger evidence in areas central to your role and more limited experience in others, provided you show understanding of the key principles.

3 Completing the personal and employment details

Before completing the technical sections, ensure the personal and employment details at the front of the form are complete and accurate. Missing information can delay assessment.

3.1 Personal details

- enter your name exactly as it appears on official documents and qualification certificates
- use a personal email address you will retain throughout the application process
- Provide a current contact telephone number
- other personal details (such as gender or nationality) are optional and not used in assessment

3.2 IChemE membership

- if you are already a member, ensure your membership number is entered correctly
- you do not need to be an existing member to apply for EngTech or TIChemE

3.3 Employment details

- state your current employer and work address
- your job title should reflect what you actually do in practice
- if your role has changed recently, ensure your evidence reflects your current level of responsibility

3.4 Curriculum Vitae (CV)

You must attach a current CV and confirm this by ticking the CV box on the form.

Your CV should:

- include your employment history with dates
- summarise key responsibilities and experience
- support (but not duplicate) the evidence you provide elsewhere

A missing or outdated CV is a common reason for delays.

4 General guidance on completing the form

4.1 Focus on your contribution

Professional reviewers must be able to see what you personally did. Avoid describing only what your team, department or company does.

Use phrases such as:

- I identified...
- I selected...
- I checked...
- I raised concerns about...

4.2 Using the STAR structure

You are encouraged to structure your examples using STAR:

- situation – brief background or context
- task – what you were responsible for
- action – what you personally did
- result – outcome, learning or improvement

One or two clear, practical examples per competence are usually sufficient.

4.3 Style and level

- write clearly and concisely
- use plain language where possible
- practical examples are more important than perfect writing
- evidence should reflect EngTech level – applied understanding and practical competence

Examples drawn from two or three different tasks or projects often provide a strong overall picture of your capability.

5 Underpinning Knowledge and Understanding (UKU)

Qualification requirements

To be admitted to Technician Member (TIChemE) grade and registered as an Engineering Technician (EngTech), applicants must demonstrate underpinning knowledge and understanding at Level 3.

Applicants will normally meet this requirement by holding:

- an IChemE-accredited Level 3 qualification or equivalent; or
- have their knowledge and understanding examined to an equivalent level via an Individual Case Procedure.

Approved or accredited qualifications

If you hold an approved or accredited by IChemE qualification listed on the Engineering Council database, list it in the application form and upload a copy of the certificate. You do not need to complete the UKU evidence section and can proceed directly to the competence sections.

Applicants without approved or accredited qualifications

If you do not hold an approved or accredited qualification, you must demonstrate how your knowledge and understanding are equivalent in outcome to that gained through formal education.

You must complete a UKU application and provide evidence against all five UKU areas below. Your knowledge and understanding will be assessed against Level 3 requirements. Evidence may be drawn from work experience, training, courses, mentoring, or self-study.

The purpose of the UKU assessment is to determine whether you have acquired the required underpinning knowledge and understanding through alternative learning and professional experience rather than through an accredited qualification.

What professional reviewers are looking for

This section provides assurance that you have sufficient underpinning knowledge and understanding to support the competences you claim later in the application. You are not expected to write academically or replicate a formal qualification.

Professional reviewers are looking for:

- **applied understanding** demonstrated through your work
- **explanations of principles** showing why things behave as they do
- **knowledge gained through experience**, training, supervision or self-study
- **evidence appropriate to EngTech level** rather than IEng or CEng

Most applicants provide one or two short, focused examples per UKU area. Examples used here may also be referenced in the competence sections.

UKU1 – Science and mathematics

What this area covers

Your grounding in the scientific and mathematical principles relevant to your work. Appendix 1 provides sample responses that illustrate the level and style of evidence expected for each UKU area.

What professional reviewers are looking for

Evidence that you understand the basic principles that underpin engineering tasks and can apply simple mathematical or numerical methods.

You might describe:

- **using scientific principles** such as temperature, pressure, flow, pH or material behaviour
- **applying calculations**, limits, tolerances or conversions
- **explaining process behaviour** and why equipment responds in certain ways

Avoid listing tasks without explaining the underlying principles.

UKU2 – Engineering analysis

What this area covers

Your ability to analyse problems using established engineering concepts, tools and information sources.

What professional reviewers are looking for

Evidence that you can investigate well-defined problems, justify your conclusions and use appropriate analytical methods.

You might describe:

- **analysing a problem** and explaining how you reached a conclusion
- **using analytical or computational tools** such as calculations, software, charts or diagnostic equipment
- **interpreting technical information** such as manuals, drawings, data sheets or procedures
- **using measurements or trends** to identify causes rather than symptoms

Avoid describing outcomes without explaining your reasoning.

UKU3 – Design and innovation

What this area covers

Your contribution to improving, modifying or developing equipment, processes or procedures.

What professional reviewers are looking for

Evidence that you can support design or improvement activities within defined limits and apply a systematic approach.

You might describe:

- **contributing to design solutions** for well-defined technical problems
- **suggesting improvements** to systems, processes or equipment
- **considering safety, environmental or user needs** when proposing changes
- **applying a structured approach** to solving problems or planning modification

Routine work alone is unlikely to be sufficient without an element of improvement or problem-solving.

UKU4 – The engineer and society

What this area covers

Your awareness of professional responsibility, ethics, diversity, sustainability and the wider impact of engineering decisions.

What professional reviewers are looking for

Practical examples showing that you act responsibly and understand the broader implications of engineering work.

You might describe:

- **evaluating environmental or societal impact** when carrying out tasks
- **applying ethical principles** such as honesty, integrity and responsible decision-making
- **identifying and mitigating risks** relevant to your work
- **considering security requirements** in your activities
- **respecting equality, diversity and inclusion** in the workplace

Use practical examples rather than general statements.

UKU5 – Engineering practice

What this area covers

Your ability to apply engineering knowledge in practical, organisational and commercial contexts.

What professional reviewers are looking for

Evidence that you understand how engineering work is carried out in practice and can use appropriate tools, processes and teamwork skills.

You might describe:

- **using practical or workshop skills** to investigate or complete tasks
- **selecting materials, tools or equipment** for well-defined work programmes
- **following quality procedures** and contributing to continuous improvement
- **understanding project or commercial context** such as cost, scheduling or value
- **working effectively in teams** and communicating with technical and non-technical colleagues
- **recording learning and development** as part of ongoing professional growth

6 Competence and commitment

This section is a fundamental part of your application. You must demonstrate how you meet each competence through your own work, responsibilities, decisions and practical engineering experience. Professional reviewers are looking for clear evidence of what you personally did, why you did it and the outcome of your actions.

The competence statements below are written exactly as they appear in the application form. Read each statement carefully and ensure your examples clearly address the specific competence being assessed.

Your C&C must be between 3,500 and 4,300 words, with each subsection roughly the same length.

The competences are grouped into five sections:

Section A – knowledge and understanding

Demonstrates how you apply engineering knowledge, technical understanding and established engineering principles in your day-to-day work.

Section B – design, development and solving engineering problems

Demonstrates how you identify problems, contribute to improvements and use appropriate methods to achieve practical engineering solutions.

Section C – responsibility, management and leadership

Demonstrates how you work reliably, take responsibility for your work, supervise or guide others where appropriate and operate safely within defined limits.

Section D – communication and interpersonal skills

Demonstrates how you communicate effectively, work collaboratively and maintain productive professional relationships with colleagues and others.

Section E – personal and professional commitment

Demonstrates your commitment to professional standards, safety, sustainability, ethical conduct and Continuing Professional Development (CPD).

You are encouraged to use the **STAR** approach when structuring your evidence:

- Situation – briefly explain the context
- Task – explain your responsibility
- Action – describe what you personally did
- Result – explain the outcome, improvement or learning

One or two strong, relevant examples for each competence are usually sufficient. Examples should focus on practical application and applied responsibility appropriate to EngTech level. It is better to provide clear and specific evidence than large amounts of general description. Reviewers should not need to 'read between the lines' to understand your contribution.

Appendix 2 provides guidance on the types of evidence that may be used for each competence.

Appendix 3 provides longer example responses illustrating the level and style of evidence expected at EngTech level. These examples are intended as guidance only and should not be copied directly. Applicants should ensure that all examples submitted are based on their own experience, responsibilities and personal contribution.

7 Sponsors declaration

7.1 Sponsors declaration to be completed by supporter

Your sponsor should:

- know your work well;
- be able to confirm that you meet the EngTech standard;
- being professionally registered is preferred, but not essential; and
- confirm electronically in the signature box provided (IChemE may verify the information supplied).

7.2 Applicant's declaration

You should:

- read the declarations together with the terms and conditions; and
- confirm your agreement by signing and dating the application (electronic signatures are acceptable).

8 Final checks before submission

Before submitting your application, ensure that:

- all sections of the application form are completed;
- your CV and copies of any qualification certificates are attached;
- your examples clearly describe your own work and contribution; and
- both your sponsor's declaration and your own declaration have been completed.

Incomplete applications are likely to delay assessment.

9 Continuing Professional Development (CPD)

EngTech registrants and Technician Members are expected to maintain and develop their competence through Continuing Professional Development (CPD).

By submitting this application, you confirm that you understand the importance of ongoing professional development and are committed to maintaining your knowledge, skills and competence throughout your professional career.

This includes:

- planning relevant CPD activities;
- recording learning and development undertaken; and
- reflecting on how CPD supports safe, effective and professional engineering practice.

Appendix 1

UKU1 – Science and mathematics

Sample response

My role as a Process Technician requires me to apply chemistry, physics and simple mathematics to understand and control processing conditions. During normal operations I monitor temperature, pressure, flow and pH trends on the DCS. I understand how increases in temperature raise vapour pressure, which affects column stability and reflux ratios. I routinely use basic calculations, for example converting flow rates from kg/h to L/min when preparing batches, and calculating dilution factors when preparing cleaning solutions following COSHH instructions (eg 1:10 dilution using simple ratio calculations).

Understanding chemical compatibility is essential when switching between solvent batches. For example, ensuring that chlorinated and non-chlorinated solvents are not mixed due to reactivity and disposal rules. My training included fundamental chemical principles (phase changes, boiling points, flammability limits, pH behaviour), which I apply when monitoring distillation columns, heat exchangers and neutralisation steps. This applied scientific knowledge allows me to identify abnormal process behaviour such as unexpected temperature rises (exotherms), foaming or pH drift and to take appropriate actions or escalate.

Why this meets the requirements

This example shows how scientific and mathematical principles are used directly in day-to-day work, rather than described in theory. It demonstrates understanding of how process variables interact, and how basic calculations support safe and accurate operation. It also shows how scientific knowledge helps the applicant recognise abnormal behaviour and take appropriate action. This reflects the applied, practical grounding expected at EngTech level.

UKU2 – Engineering analysis

Sample response

I regularly analyse process data to identify trends and problems. For example, during a routine check on our solvent distillation unit I noticed a gradual drop in product throughput over several days. I reviewed DCS trend data (column temperature profile, differential pressures and flow rates) and observed an increase in pressure across the packed section, indicating partial fouling. I discussed findings with the process engineer and maintenance who confirmed fouling during shutdown.

I also use analytical skills during sampling – comparing laboratory results against control limits to confirm process stability. When pH values drift out of range during neutralisation I assess reagent addition rates, tank mixing and probe calibration. My fault-finding approach is structured: observe condition, check data, review recent changes, assess likely causes, escalate with evidence.

Why this meets the requirements

This example demonstrates a clear, logical approach to analysing well-defined engineering problems. It shows how data and technical information are used to identify causes, not just symptoms, and how conclusions are supported by evidence. It also illustrates the use of appropriate tools such as DCS trends, lab results and process measurements. The structured fault-finding method reflects the level of engineering analysis expected of an EngTech applicant.

UKU3 – Design and innovation

Sample response

Although my role is not design-authority, I contribute to practical improvements within defined boundaries. For example, I helped develop an improved flushing procedure for transfer lines during product changeovers. The

previous method led to solvent residues and extra waste. I provided operations feedback from shift experience, identified areas where stagnant solvent remained, and trialled an air-nudge technique after nitrogen purging to clear dead legs. The improvement reduced flushing solvent consumption by ~12% and cut changeover time by ~15 minutes on average. I also supported commissioning during the upgrade of a distillation reboiler, providing observations on valve positions, warm-up rates and venting steps which were later incorporated into the permanent operating procedure.

Why this meets the requirements

This example shows meaningful contribution to design and improvement activities within appropriate limits. It demonstrates a systematic approach to identifying issues, trialling solutions and evaluating outcomes. The applicant considers operational needs, efficiency and waste reduction, and provides measurable benefits. The commissioning example further shows involvement in refining procedures and supporting system improvements. This reflects the practical, bounded design input expected at EngTech level.

UKU4 – The engineer and society

Sample response

Working safely, ethically and responsibly is central to my role. I follow permit-to-work, risk assessments, LOTO and COSHH procedures. I completed training on DSEAR, manual handling and environmental awareness. I understand that chemical operations have societal impacts, so I actively report near misses, unsafe conditions and environmental concerns (eg small leaks, waste segregation issues). I treat colleagues with respect and understand inclusion through working with diverse contractors during shutdowns. I raise concerns if I believe an action could compromise safety or environmental compliance. For example, I once challenged the disposal route for a waste solvent drum that was incorrectly labelled, preventing potential environmental non-compliance.

Why this meets the requirements

This example demonstrates responsible and ethical behaviour through real actions rather than general statements. It shows awareness of environmental and societal impacts, and a willingness to challenge unsafe or non-compliant practices. It also reflects understanding of inclusion and respectful working relationships. The focus on practical behaviours – reporting concerns, following procedures, preventing environmental harm – aligns well with EngTech expectations for professional responsibility.

UKU5 – Engineering practice

Sample response

My on-the-job experience has developed my ability to apply engineering concepts in real plant situations. My work requires operating with detailed and comprehensive SOPs, understanding P&IDs in the context of plant operations and insuring compliance with COSHH sheets and quality standards such as ISO9001. I work with maintenance, engineering, contractors and the laboratory to deliver production to specification. I understand commercial drivers such as yield, quality, downtime, safety and waste minimisation. My role also involves communication (shift handovers, logbooks, toolbox talks) and teamwork during startups, shutdowns and maintenance. I contributed to a Kaizen 5S event that improved housekeeping and hose management in the solvent storage area, reducing tripping hazards and changeover times.

Why this meets the requirements

This example shows practical application of engineering tools, documentation and standards in real operational settings. It demonstrates effective teamwork and communication across different functions, and awareness of commercial factors such as efficiency, quality and waste. The improvement activity illustrates engagement with continuous improvement and safe working practices. Together, these elements reflect the practical engineering competence expected of an EngTech applicant.

Appendix 2

A: Knowledge and understanding

A1: Review and select appropriate techniques, procedures and methods to undertake (chemical, biochemical or process engineering) tasks

Use this section to show how you choose and apply established techniques or procedures in your role.

You might describe:

- selecting a test method, procedure or tool with reasoning
- following procedures while exercising judgement
- recognising when escalation or deviation is required

Avoid:

- simply stating that you follow procedures
- listing tasks with no explanation of why a method was chosen

Possible examples of evidence:

- **Evaluating potential methods of carrying out an engineering task and selecting the most appropriate solution**
  - When preparing a reactor for cleaning, I compared manual rinsing, CIP circulation and steam-out, selecting CIP because it achieved the required cleanliness with lower solvent use and shorter downtime.
  - For a blocked solvent transfer line, I considered the options of nitrogen purging, air-nudge and mechanical rodding, choosing nitrogen purging as it avoided contamination risks and complied with hazardous-area controls.

- **Recognising a difficulty and then identifying an approach to resolve it**
  - During a batch distillation, I noticed unstable temperatures and identified a sticking reflux valve, switching to manual control and raising a maintenance request with supporting data.
  - When a filtration step slowed, I recognised cake build-up as the likely cause and adjusted differential pressure while scheduling a filter change to restore flow.

- **Identifying an improvement in a technique, procedure, process or method**
  - I proposed adding a pre-rinse step to the vessel cleaning procedure after observing residue hotspots, reducing cleaning time and improving batch consistency.
  - I suggested relocating a pH probe to improve contact with mixed liquor during neutralisation, reducing drift and improving control accuracy.

- **Interpreting and carrying out test procedures**
  - I performed a heat-exchanger performance test by recording inlet/outlet temperatures and flow rates and comparing them with acceptance criteria to confirm fouling.
  - I carried out a solvent purity check using the site GC method, interpreting chromatograms to verify that the batch met specification before release.

A2: Use appropriate scientific, technical, chemical, biochemical or process engineering principles

Use this section to show that you understand the principles behind your work.

You might describe:

- process behaviour (eg pressure, temperature, flow, pH)
- calculations, limits or tolerances
- how engineering principles influenced decisions

Avoid:

- vague statements such as 'I applied engineering principles'
- descriptions with no technical explanation

Possible examples of evidence:

- **Drawing on your technical knowledge to complete a task**
  - When adjusting a distillation column, I used my understanding of vapour-liquid equilibrium to propose a change to the reflux and heat input, stabilising product purity.
  - During neutralisation, I applied acid-base principles to predict how dosing changes would affect pH response and prevent overshoot.

- **Performing calculations using standard formulae**
  - I calculated dilution ratios when preparing cleaning solutions, ensuring correct concentrations based on COSHH requirements.
  - I used heat-transfer equations to estimate expected temperature rise across a heat exchanger and compared this with actual readings to identify fouling.

- **Analysing performance or test data or comparing performance information with published material**
  - I reviewed pump performance curves to confirm that reduced flow was due to impeller wear rather than suction blockage.
  - I compared laboratory viscosity results with supplier specifications to verify that a raw material batch was suitable for use.

B: Design, development and solving engineering problems

B1: Identify problems and apply appropriate methods to identify causes and achieve satisfactory solutions

Use this section to show how you deal with engineering problems.

You might describe:

- recognising abnormal conditions or faults
- investigating causes
- implementing or contributing to solutions
- learning from outcomes

Avoid:

- stating the outcome without explaining how you got there
- trial-and-error descriptions with no analysis

Possible examples of evidence:

- **Using knowledge to identify a problem or an opportunity for improvement**
  - I noticed rising differential pressure across a filter and recognised it as early fouling, preventing an unplanned shutdown.
  - I identified that inconsistent batch yields were linked to inadequate mixing and proposed adjusting agitator speed profiles.

- **Investigating a problem to identify the underlying cause**
  - When a reactor failed to reach target temperature, I checked steam supply, condensate return and jacket flow, identifying a partially closed isolation valve.
  - I investigated recurring pH drift by reviewing dosing logs and discovered intermittent probe calibration failure.

- **Identifying a solution to a problem or an improvement opportunity**
  - I recommended installing a sight-glass on a transfer line to help operators detect air entrainment, reducing pump cavitation events.
  - I proposed modifying the CIP sequence to include a warm-water flush, improving cleaning effectiveness.

- **Contributing to the design of an item or process**
  - I provided operational input during the design of a new solvent charging system, helping determine valve locations and hose routing.
  - I contributed to a trial of alternative filter media, supplying performance data that informed the final selection.

B2: Identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact

Use this section to show how you plan and use resources.

You might describe:

- planning or prioritising work
- selecting materials, tools or people
- considering safety, cost, quality or environmental impact

Avoid:

- describing tasks with no reference to planning
- ignoring safety or environmental considerations

Possible examples of evidence:

- **Balancing these factors in selecting appropriate materials**
  - I proposed a corrosion-resistant gasket material for a caustic line after reviewing compatibility charts and cost implications.
  - I suggested a low-shear pump for a shear-sensitive product to maintain quality while minimising energy use.

- **Identifying precautions as a result of evaluating risks and other factors**
  - Before opening a vessel, I reviewed the risk assessment and ensured nitrogen purging was complete to avoid flammable atmospheres.

- I identified the need for additional spill containment when handling a high-hazard solvent and arranged appropriate equipment.

- **Considering how waste can be minimised, recycled or disposed of safely**
  - I adjusted flushing volumes during changeovers to minimise solvent waste while still achieving cleanliness standards.
  - I segregated aqueous and organic waste streams to maximise recycling and reduce disposal costs.

- **Contributing to best practice methods of continuous improvement**
  - I participated in a Kaizen event to streamline hose management, reducing trip hazards and improving changeover efficiency.
  - I helped develop a standardised sampling checklist that reduced errors and improved lab turnaround time.

- **Improving the quality of an operation or process**
  - I proposed the introduction of a double-check step for raw material labelling after identifying repeated mix-ups, improving batch accuracy.
  - I recommended adjusting heating ramp rates to reduce thermal stress on equipment and improve product consistency.

C: Responsibility, management and leadership

C1: Work reliably and effectively without close supervision, to the appropriate codes of practice

Use this section to show that you can work independently within defined limits.

You might describe:

- carrying out tasks safely without direct supervision
- maintaining standards
- knowing when to seek advice

Avoid:

- suggesting you always need close supervision
- giving examples that show no personal responsibility

Possible examples of evidence:

- **Completing challenging tasks successfully within your area of work**
  - I independently completed a reactor charging sequence following SOPs, verifying each stage to ensure correct sequencing and avoid overpressure or contamination risks.
  - I carried out routine column start-ups without supervision, ensuring temperatures and pressures remained within limits.

- **Identifying issues which fall outside of your current knowledge and seeking advice**
  - When encountering unexpected foaming during a batch, I paused the operation and consulted the process engineer before proceeding.
  - I sought maintenance support when a pump vibration reading exceeded my experience level, providing trend data for assessment.

- **Identifying standards and codes of practice relevant to a new task**
  - Before assisting with a pressure test, I reviewed the site pressure-testing procedure and relevant safety standards.
  - When assigned to a new product line, I familiarised myself with the specific cleaning validation requirements.

C2: Accept responsibility for the work of themselves or others

Use this section to show accountability.

You might describe:

- checking your own work
- ensuring permits, isolations or controls are correct
- taking responsibility for quality or safety

Avoid:

- implying responsibility always lies with others
- failing to show checking or verification

Possible examples of evidence:

- **Fully understanding drawings, permits to work, instructions or other similar documents after appropriate checking, and identifying issues**
  - I reviewed a permit-to-work for vessel entry and identified a missing isolation, ensuring it was corrected before work began.
  - I checked P&IDs before a line break and spotted an incorrect valve reference, preventing a potential mis-isolation.

- **Inspecting work carried out by others**
  - I verified that contractors had correctly installed a new hose station, checking fittings and tagging before signing off.
  - I inspected a cleaned vessel to ensure no residue remained before approving it for the next batch.

- **Checking the status of equipment, the work environment and facilities and taking appropriate actions before commencing work**
  - Before starting a transfer, I confirmed pump lubrication, valve positions and containment trays were correctly set up.
  - I checked that gas detectors and ventilation were operational before beginning solvent handling.

C3: Accept, allocate and supervise technical and other tasks

Supervision at EngTech level may be informal.

You might describe:

- guiding new colleagues
- allocating routine tasks
- overseeing contractors or trainees
- checking completed work

Avoid:

- stating you supervise others without examples
- overstating management authority

Possible examples of evidence:

- **Ensuring that the scope of a task is clear before accepting and/or allocating it to others**
  - I clarified sampling requirements with the lab before assigning the task to a trainee, ensuring correct containers and volumes were used.
  - I confirmed isolation boundaries with maintenance before allowing contractors to begin work.

- **Querying any aspect of a task which is not clear and/or providing an explanation if a query is raised by others**
  - When asked to run an unfamiliar cleaning cycle, I queried the sequence with engineering to confirm the correct parameters.
  - I explained the rationale behind slow heating rates to a new operator to prevent thermal shock.

- **Learning from your own experience and/or providing constructive feedback when supervising or working with others**
  - After observing repeated hose-routing issues, I coached colleagues on best practice and shared lessons learned.
  - I provided feedback to a trainee on improving sampling accuracy, demonstrating correct technique.

D: Communication and interpersonal skills

D1: Communicate effectively with others, at all levels, in English

Use this section to show clear communication.

You might describe:

- written logs, reports or emails
- shift handovers
- explaining technical information

Avoid:

- stating that communication occurs with no example
- unclear or overly brief descriptions

Possible examples of evidence:

- **Contributing to meetings and discussions**
  - I contributed to daily production meetings by summarising overnight process deviations and proposed corrective actions.
  - I participated in HAZOP reviews, providing operator insight into practical equipment limitations.

- **Preparing communications, documents and reports on technical matters**
  - I contributed to a deviation report explaining the cause of a failed batch and recommended preventive measures.

- I prepared a commissioning log documenting valve checks, temperature profiles and start-up observations.

- **Exchanging information and providing advice to technical and non technical colleagues**
  - I explained sampling requirements to contractors unfamiliar with chemical handling procedures.
  - I advised a new operator on interpreting DCS trends during a distillation run.

D2: Work effectively with colleagues, clients, suppliers or the public

Use this section to show teamwork and collaboration.

You might describe:

- working with engineers, contractors or suppliers
- contributing to team problem-solving
- supporting shared objectives

Avoid:

- mentioning team activity without your contribution
- describing conflict with no resolution

Possible examples of evidence:

- **Contributing constructively as part of a team**
  - I worked with maintenance and engineering to plan a heat-exchanger shutdown, ensuring safe isolation and efficient cleaning.
  - I supported the lab team by adjusting sampling schedules during high-workload periods.

- **Successfully resolving issues in discussions with team members, suppliers, clients and/or others**
  - I resolved a disagreement with a contractor about hose routing by reviewing the P&ID together and agreeing on a safe configuration.
  - I worked with a supplier to troubleshoot inconsistent raw material viscosity, sharing process data to identify the cause.

- **Persuading others to accept suggestions or recommendations**
  - I convinced the shift team to adopt a revised flushing sequence by demonstrating reduced solvent use and faster changeovers.
  - I recommended a change in sampling frequency during a process upset and gained agreement by presenting trend data.

- **Identifying, agreeing and working towards collective goals**
  - I collaborated with the team to reduce batch cycle time, contributing ideas that improved heating efficiency.
  - I supported a site initiative to reduce waste by helping implement improved segregation practices.

D3: Demonstrate personal and social skills and awareness of diversity and inclusion issues

Use this section to show professional and respectful behaviour.

You might describe:

- adapting communication styles
- supporting colleagues
- working respectfully with people from different backgrounds

Avoid:

- generic statements with no example
- treating diversity as a tick-box exercise

Possible examples of evidence:

- **Knowing and managing own emotions, strengths and weaknesses**
  - I remained calm during a process upset, focusing on data collection and escalation rather than reacting impulsively.
  - I recognised that I needed more experience with a new DCS interface and requested additional training.

- **Being confident and flexible in dealing with new and changing interpersonal situations**
  - I adapted quickly to working with a new contractor team during shutdown, adjusting communication style to ensure clarity.
  - I supported a colleague struggling with a new task by offering guidance and breaking down the steps.

- **Creating, maintaining and enhancing productive working relationships, and resolving conflicts**
  - I helped resolve a disagreement between operators about sampling priorities by facilitating a discussion and agreeing a fair schedule.
  - I built strong relationships with maintenance by consistently providing clear isolation information and feedback.

- **Being supportive of the needs and concerns of others, especially where this relates to diversity and inclusion**
  - I ensured a new colleague with limited English proficiency received clear written instructions and extra time for training.
  - I supported a team member returning from leave by helping them catch up on process changes.

E: Personal and professional commitment

E1: Understand and comply with relevant codes of conduct

Use this section to show how you act professionally.

You might describe:

- following professional standards
- acting with integrity
- taking responsibility for your actions

Avoid:

- simply stating compliance with no example

Possible examples of evidence:

- **Demonstrating compliance with your Licensee's Code of Professional Conduct**
  - I followed confidentiality requirements when handling sensitive batch data and ensured it was stored securely.
  - I adhered to professional conduct expectations by reporting a near miss honestly and without omission.

- **Working within all relevant legislative and regulatory frameworks**
  - I ensured all waste drums were labelled and stored according to environmental regulations before collection.
  - I followed DSEAR requirements when handling flammable solvents, including grounding and bonding equipment.

E2: Understand the safety implications of their role and apply safe systems of work

Use this section to show how you work safely.

You might describe:

- risk assessments
- permits to work
- isolation procedures
- safe behaviours

Avoid:

- describing safety rules without showing application
- implying safety is someone else's responsibility

Possible examples of evidence:

- **Providing evidence of applying current safety requirements**
  - I completed a risk assessment before opening a vessel and ensured all isolations and gas tests were in place.
  - I applied lock-out/tag-out procedures before maintenance began on a pump, verifying zero-energy state.

- **A sound knowledge of health and safety legislation and company safety policies**
  - I followed site procedures aligned with HASAW and COSHH when handling corrosive chemicals, using correct PPE and containment.
  - I applied CDM principles during shutdown planning by coordinating contractor access and ensuring safe work areas.

E3: Understand the principles of sustainable development and apply them in their work

Use this section to show environmental awareness.

You might describe:

- waste reduction
- energy efficiency
- environmental protection measures

Avoid:

- vague references to sustainability with no example

Possible examples of evidence:

- **Recognising how sustainability principles can be applied in day-to-day work**
  - I reduced solvent use during flushing by optimising rinse volumes while still meeting cleanliness criteria.
  - I supported energy-saving initiatives by adjusting heating profiles to minimise peak demand.

- **Identifying actions that improve sustainability**
  - I introduced improved waste segregation practices to increase recycling rates and reduce disposal costs.
  - I recommended reusing recovered solvent for initial rinses, reducing virgin solvent consumption.

E4: Carry out and record the Continuing Professional Development (CPD) necessary to maintain and enhance competence

Use this section to show how you maintain and develop your competence.

You might describe:

- training or learning activities
- reflection on what you learned
- future development plans

Avoid:

- listing activities with no reflection
- outdated or incomplete CPD records

Possible examples of evidence:

- **Undertaking reviews of your own development needs**
  - I identified a need to improve my understanding of heat-transfer principles and enrolled in a relevant training course.
  - I recognised gaps in my DCS troubleshooting skills and arranged shadowing sessions with an experienced operator.

- **Planning how to meet personal and organisational objectives**
  - I created a CPD plan focusing on process safety and advanced sampling techniques to support upcoming responsibilities.
  - I aligned my development goals with the site's digitalisation project by learning new data-logging tools.

- **Carrying out and recording planned and unplanned CPD activities**
  - I recorded attending a vendor training session on new pump technology and summarised key learning points.
  - I documented learning gained during a plant upset investigation and how it improved my future response.

- **Maintaining evidence of competence development**
  - I keep a CPD log with certificates, reflections and examples of how training has been applied in my work.
  - I update my record after completing internal competency assessments.

- **Evaluating CPD outcomes against any plans made**
  - After completing a process-safety course, I reviewed how the learning improved my hazard-spotting skills.
  - I assessed whether my new sampling techniques reduced lab deviations as planned.

- **Assisting others with their own CPD**
  - I supported a new colleague by sharing my CPD plan and helping them structure their own.
  - I encouraged team members to attend a vendor workshop and shared notes afterwards.

E5: Understand the ethical issues that may arise in their role and carry out their responsibilities in an ethical manner

Use this section to show ethical awareness.

You might describe:

- raising concerns
- honest reporting
- making ethical decisions

Avoid:

- stating ethical awareness without a real example

Possible examples of evidence:

- **Understanding the ethical issues that you may encounter in your role**
  - I recognised the ethical implications of releasing off-spec material and ensured the batch was quarantined rather than passed on, even under production pressure.
  - When reviewing waste handling practices, I identified that a shortcut being used by a colleague could breach environmental regulations and raised the issue appropriately.

- **Giving an example of where you have applied ethical principles**
  - I reported a near miss involving a mis-labelled solvent drum, even though it had already been corrected, because accurate reporting is essential for preventing future incidents.
  - I refused to bypass an interlock during a process upset, explaining that doing so would violate safety procedures and could create unacceptable risk.

- **Giving an example of where you have applied or upheld ethical principles as defined by your organisation or company**
  - I followed company integrity policies by declaring a potential conflict of interest when a supplier I knew personally was bidding for a contract.
  - I upheld ethical standards by challenging a suggestion to 'adjust' sampling frequency to save time, explaining that it would compromise data integrity and product quality.

Appendix 3

A1: Review and select appropriate techniques, procedures and methods to undertake (chemical, biochemical or process engineering) tasks

During routine tank loading operations in our chemical production unit, I noticed a gradual reduction in flow from a product transfer pump that threatened to extend loading times and disrupt downstream processes. To investigate the issue, I reviewed shift logs, DCS flow trends and suction pressure readings, selecting these monitoring methods because they provided the most reliable indication of pump and line performance without interrupting operations.

Using my understanding of fluid flow and pump hydraulics, I compared the operating data with normal performance conditions and identified a reduction in suction pressure without abnormal vibration or increased motor load. From this, I concluded that the issue was more likely to be caused by an upstream restriction rather than an internal mechanical pump fault.

I therefore arranged inspection of the suction strainer during planned downtime and identified particulate accumulation restricting flow. I documented the findings and worked with maintenance to clean the strainer and introduce a more frequent inspection schedule. Following these actions, normal flow rates were restored, preventing operational delays and improving the reliability of the loading process.

A2: Use appropriate scientific, technical, chemical, biochemical or process engineering principles

During operation of a solvent recovery distillation system, I monitored temperature, pressure and reflux trends to maintain product purity and efficient solvent recovery. I applied my understanding of boiling points and vapour-liquid behaviour to adjust reflux rates and steam input when process conditions became unstable during a production campaign.

I compared column temperatures and condenser performance against normal operating ranges and identified that reduced cooling-water flow was affecting solvent condensation efficiency. After confirming this through process readings and inspection, I coordinated corrective action with utilities and operations teams.

I also carried out routine calculations to check solvent recovery rates and compared laboratory purity results with specification limits to confirm process performance. These actions restored stable operation, maintained product quality and reduced solvent losses.

B1: Identify problems and apply appropriate methods to identify causes and achieve satisfactory solutions

During routine operation of a distillation column, I observed that the overhead product composition was consistently below specification, resulting in increased off-spec material. To investigate the issue, I reviewed historical process logs and compared temperature, pressure, reflux ratio and feed flow trends against normal operating conditions over several shifts. I selected these methods because they allowed me to identify abnormal process behaviour and focus on the most likely causes affecting product quality.

I then systematically checked possible causes by reviewing operator actions, inspecting upstream feed pumps and checking instrumentation and alarms for faults or abnormal readings. From this investigation, I identified that a partial blockage in the reboiler circulation line was restricting vapour flow and reducing separation efficiency.

To confirm the issue, I carried out additional monitoring of flow and temperature readings across the column and compared the results with normal operating values. Once confirmed, I coordinated with operations and maintenance to clear the blockage and adjusted operating conditions to restore stable circulation.

Following these actions, the column returned to specification, reducing off-spec production by approximately 7% and improving process stability. I also updated the operational checklist to include regular monitoring of the circulation line to help prevent recurrence.

B2: Identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security, and environmental impact

During an upgrade to the solvent recovery system, I supported the installation of new condensers and pipework while

helping maintain ongoing production activities. I reviewed the planned work schedule and identified the personnel, tools and materials needed for each stage of the installation.

I helped organise tasks so that higher-risk activities were carried out during planned low-production periods to minimise operational disruption and maintain safe working conditions. I also ensured that responsibilities were clearly allocated, with operators monitoring process conditions while maintenance teams carried out equipment installation and testing.

Throughout the work, I monitored progress and adjusted task priorities when a delayed pipework delivery threatened to affect the schedule. I reorganised available resources so work could continue safely and efficiently without affecting quality standards or environmental controls. I also worked with stores and procurement to reduce unnecessary material use and minimise waste during installation activities.

Following completion of the upgrade, the system achieved the expected solvent recovery performance with no safety or environmental incidents. I recorded lessons learned and contributed to improvements for future maintenance and upgrade activities.

C1: Work reliably and effectively without close supervision, to the appropriate codes of practice

While monitoring a continuous chemical reaction in the production unit, I was responsible for operating part of the plant independently during a weekend shift. Before starting operations, I reviewed the relevant standard operating procedures and safety and environmental requirements to ensure the plant would be operated in accordance with site procedures and codes of practice.

I carried out pre-start checks on the equipment, confirmed that instruments were within calibration status, and checked operating parameters against normal historical trends. During the shift, I monitored process conditions, recorded operating data and responded to minor fluctuations by adjusting feed rates and temperatures within my authorised operating limits.

When a small deviation in reactor pressure occurred, I reviewed the operating procedure and applied the recommended corrective actions without requiring immediate supervisory support. I continued to monitor the system closely to ensure conditions returned to normal safely and efficiently.

At the end of the shift, I completed a detailed handover report outlining process conditions, observations and actions taken so the incoming shift had a clear operational record. The process remained stable throughout the shift, with all operating conditions maintained within specification.

C2: Accept responsibility for the work of themselves or others

During commissioning of a new chemical dosing system, I was responsible for carrying out and verifying the calibration of process instruments within the unit. Before starting the work, I reviewed the calibration procedure and relevant safety and quality requirements to ensure all activities would comply with site standards and codes of practice.

I prepared the required tools, reference standards and documentation in advance, checking that all calibration equipment was within certification and suitable for use. During the work, I followed each calibration step carefully, recorded results accurately and compared readings against the required operating ranges.

When I identified an incorrect reading on one flow transmitter, I investigated possible causes, reviewed the calibration procedure and carried out corrective adjustment and rechecking before allowing the instrument to be returned to service. I also verified that associated measurements had not been affected.

Before completing the task, I double-checked all calibration records and confirmed that the instruments met the required tolerances before signing the completion documentation for management approval. By taking responsibility for the accuracy and quality of the work, I helped ensure that the dosing system could operate safely, reliably and in accordance with site quality standards.

C3: Accept, allocate and supervise technical and other tasks

During a planned plant shutdown involving several contractors unfamiliar with the site, I was responsible for coordinating and supervising technical tasks across the work team. Before work started, I reviewed the shutdown scope and considered the experience and skills of each contractor so tasks could be allocated appropriately. Critical activities such as isolations and chemical handling were assigned to personnel with relevant competence and authorisation.

I guided contractors to their work areas, provided briefings on site-specific hazards including hot lines and chemical storage areas, and checked that the correct permits and safety controls were in place before work began. Throughout the shutdown, I monitored progress, clarified uncertainties, checked that procedures were being followed and ensured housekeeping standards were maintained.

When minor issues arose during the work, I provided guidance and adjusted task priorities to maintain safe and efficient progress without causing delays. Before handing completed areas back to operations, I checked that work had been completed correctly and that all isolations, safety controls and housekeeping requirements had been restored.

The shutdown was completed on schedule with no safety incidents, and the contractors provided positive feedback on the clarity of supervision and communication during the work.

D1: Communicate effectively with others, at all levels, in English

During commissioning of modifications to a solvent recovery process, I was responsible for communicating operational changes to production operators, maintenance personnel and supervisors. I prepared written operating notes and updated shift handover information in clear English so all teams understood the revised operating sequence and safety precautions.

Before start-up, I explained the process changes during a toolbox talk, using simple diagrams and examples to help operators understand the impact on temperatures, flow rates and sampling requirements. I adapted my communication style depending on the audience, providing practical operating guidance to operators while discussing technical details and instrumentation checks with maintenance technicians.

During commissioning, I maintained regular communication with the control room and engineering team, reporting progress, explaining process observations and highlighting any issues requiring attention. I encouraged questions from colleagues and clarified instructions where necessary to ensure safe and consistent operation.

At the end of the commissioning activity, I completed a detailed handover report summarising operating conditions, adjustments made and any follow-up actions required. The modifications were introduced successfully with minimal disruption, and the updated instructions were later used as part of operator training.

D2: Work effectively with colleagues, clients, suppliers or the public

During installation of a new heat exchanger, I worked closely with operations staff, maintenance personnel and an external supplier unfamiliar with the site. Before work began, I reviewed the installation schedule and technical requirements and helped coordinate tasks according to the experience and responsibilities of each group.

I explained local hazards, site procedures and safety requirements to the supplier team, encouraging questions to confirm understanding and using practical examples where needed. Throughout the installation, I maintained regular communication with operations, maintenance and the supplier, monitoring progress and helping resolve issues to keep the work moving safely and efficiently.

When the supplier identified a dimensional mismatch during installation, I worked with the design team to obtain revised information and communicated the changes clearly to the work teams before installation resumed. I also checked that the agreed changes were recorded correctly and that work continued in accordance with site procedures.

At the end of the shutdown, I supported the handover back to operations, confirming that the equipment had been installed correctly and was ready for service. The installation was completed on schedule with no safety incidents, and the teams involved provided positive feedback on the communication and coordination throughout the work.

D3: Demonstrate personal and social skills and awareness of diversity and inclusion issues

During a project to improve solvent handling procedures, I worked as part of a team involving operators, engineers and a recently recruited technician from a different cultural background. I noticed that some team members were reluctant to contribute ideas during larger group discussions, particularly those who were new to the site or less confident communicating in technical meetings.

To encourage participation, I spoke with team members individually and in smaller group discussions, actively inviting input from quieter colleagues and ensuring technical explanations were clear and easy to understand. I adapted my communication style where needed to support language differences and checked understanding by asking for feedback and clarification.

When reviewing the updated procedures, I ensured that suggestions and concerns from all team members were considered, including operational and safety observations raised by colleagues from different roles and backgrounds. I also made sure these points were reflected in the final procedure updates and risk assessment discussions.

As a result, the team worked collaboratively and all members contributed to the final procedures. The revised process was implemented successfully with good understanding across the team and strong compliance with safety requirements. Feedback from colleagues indicated that the inclusive approach improved communication and confidence, particularly for newer team members.

E1: Understand and comply with relevant codes of conduct

During implementation of changes to a chemical blending and storage process, I was responsible for checking that the work complied with site safety, environmental and operating procedures. Before the changes were introduced, I reviewed the relevant procedures, storage requirements and safety controls to identify any risks associated with the new arrangement.

While reviewing the planned storage sequence, I identified that the proposed arrangement could increase the risk of cross-contamination between chemicals and potentially create an environmental compliance issue. I raised the concern immediately and stopped the change from progressing until the issue had been reviewed.

I then worked with operations and safety personnel to revise the storage arrangement by introducing segregated containment and improved labelling controls to reduce the contamination risk. Throughout the process, I recorded the actions taken and ensured that the revised procedures were updated in accordance with site documentation requirements.

Before the revised process was introduced, I explained the updated procedures and safety reasons to the operating team to ensure the changes were understood and followed correctly. The revised arrangement operated safely and within environmental requirements, and the updated procedures were later included in the site operating manual for future reference and training.

E2: Understand the safety implications of their role and apply safe systems of work

While operating a continuous chemical distillation unit, I was responsible for controlling the reflux system, where incorrect adjustments could create risks such as overpressure, temperature excursions or vapour release. Before making any changes, I reviewed the relevant operating procedures, risk assessments and site safety requirements to understand the hazards associated with the task.

I recognised that increasing reflux would directly affect process temperatures and pressures and could potentially move the system outside safe operating limits if changes were made too quickly. To manage this safely, I followed the approved operating procedure and adjusted the reflux setpoints gradually while continuously monitoring pressure, temperature and safety interlocks.

During the adjustment, a minor pressure deviation occurred. I immediately paused the operation, checked process variables, confirmed that valves and control loops were functioning correctly and verified that the system remained within safe operating conditions before continuing. I also ensured alarms and emergency shutdown systems remained available throughout the task.

All actions, observations and corrective steps were recorded in the shift log in accordance with site safety procedures. The reflux adjustment was completed successfully with the process remaining within safe operating limits and no alarms, releases or safety incidents occurring.

E3: Understand the principles of sustainable development and apply them in their work

During routine operation of the solvent recovery system, I noticed that significant quantities of solvent were being lost through venting, increasing both operating costs and environmental emissions. I reviewed operating data, solvent recovery trends and condenser performance to identify opportunities to improve efficiency and reduce waste.

Working with operations and engineering colleagues, I suggested adjustments to reflux operating conditions and improvements to condenser operation to increase solvent recovery while maintaining safe and stable process

conditions. I also discussed practical implementation requirements with maintenance personnel to ensure the changes could be introduced safely and with minimal disruption to production.

After the changes were introduced, I monitored solvent recovery rates, energy usage and operating conditions to confirm that the improvements were effective. The revised operating approach increased solvent recovery, reduced VOC emissions and lowered energy consumption during production batches.

The updated operating procedures were recorded and shared with operators to support continued efficient operation. This work demonstrated how sustainable development principles such as waste reduction, resource efficiency and environmental protection can be applied in day-to-day engineering activities without affecting product quality or safety.

E4: Carry out and record the Continuing Professional Development necessary (CPD) to maintain and enhance competence in their own area of practice

To maintain and enhance my competence in chemical process operations, I carried out several Continuing Professional Development (CPD) activities during the past year. I identified areas where I needed further development, including process control, energy efficiency and safe chemical handling, through operational experience and feedback from supervisors.

To improve my knowledge, I completed an online process control course, attended a workshop on energy efficiency in chemical plants and participated in site safety training covering hazardous material handling. After each activity, I reviewed what I had learned, recorded key points in my CPD log and considered how the learning could be applied in my day-to-day work.

I applied the improved process control knowledge when adjusting operating conditions on a distillation unit, helping improve product quality and reduce energy usage. I also shared learning from the energy efficiency and safety training with colleagues during shift handovers and operating procedure updates to improve awareness across the team.

All CPD activities, reflections and examples of practical application were recorded in my professional development log in line with company and IChemE guidance. This provided a structured record of how I maintain and develop my competence to support safe and effective engineering practice.

E5: Understand the ethical issues that may arise in their role and carry out their responsibilities in an ethical manner

During a production improvement activity, I identified that a proposed change intended to increase batch throughput could potentially expose operators to higher solvent vapour levels in an area where ventilation was not ideal. Although the proposed operating conditions would not immediately exceed legal exposure limits, I recognised that the change could still create unnecessary risk to operator health and wellbeing.

I raised the concern and paused implementation of the change until the risks had been reviewed with the operations team and site safety officer. Together, we discussed alternative ways to improve throughput while reducing potential exposure risks, including changes to operating schedules, improvements to local extraction and the use of additional protective equipment where appropriate.

I documented the concerns raised, the reasoning behind the decision and the agreed control measures, and ensured the revised approach was communicated clearly to the work team before implementation.

The updated operating method was introduced successfully, maintaining operator exposure well within recommended safe limits while still improving production performance. The approach also improved confidence among operators that safety and wellbeing were being considered appropriately during operational changes.

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