



ENGINEERS
AUSTRALIA

CHARTERED

WRITING ENGINEERING COMPETENCY CLAIMS



1. About the Competencies

The 2012 Australian Engineering Competency Standards Stage 2 for all three occupational categories (Professional Engineer, Engineering Technologist and Engineering Associate) each comprises sixteen elements of competence divided into four principal groups (units):

- **Personal commitment**
- **Obligation to community**
- **Value in the workplace**
- **Technical proficiency**

Each element of competence offers several indicators of attainment, which serve as guides to the engineering work likely to be considered as demonstrating attainment of that competence.

You will be preparing an Engineering Competency Claim (ECC) for each of the Competency Standards. You must demonstrate competence in each Area of Practise you are seeking Chartered or Registration. For each ECC, you must write an account of your actions and decisions in one or more separately verified episodes of your engineering, providing evidence of your personal competence in that particular Element. These actions and decisions must be specific, actual, and verifiable – not just statements of principles, nor of general behaviour.

Your evidence for a particular ECC must be sufficient to demonstrate your competence in *all* aspects of ‘*what this element means in practice*’ (as specified in the second column of the tables in the Stage 2 Competency Standards that apply to your Occupational Category).

The Stage 2 Competency Standards list *Indicators of Attainment* for each Element (in the third column of the tables). These serve as *guides* to the sorts of engineering work that are likely to demonstrate competence in the Element.

In Elements that refer to *Engineering Problems* and *Engineering Activities*, your account of your personal experience must have some or all of the characteristics of the relevant *Engineering Problems* and *Engineering Activities*, as defined in the Stage 2 Competency Standards.

Separate Competencies and Indicators of Attainment are in place for Leadership & Management, Systems Engineering and Cost Engineering. Separate Indicators of Attainment for Academics seeking Chartered are also in place. Please ensure you are referring to the right Competency Documents when preparing your Chartered Application.

2. Writing ECCs

2.1 Preparation

Your capability (competence) develops through experience and interactions with others. Think back over your career to date and write down five or six episodes that you feel stretched you and to which you made significant contributions.

Develop your notes to include the level of detail anticipated by the description of *engineering activities* and *engineering problems* in the Stage 2 Competency Standards.

These notes can come from material you have contributed to, such as proposals, specifications, design reports, project appraisals and your resume. Clearly acknowledge the contributions from others, and distinguish contributions you think you have made as a result of discussions or collaboration with other people. At this stage you should expect your notes to be at least three or four pages. Print it and be ready to make notes on it.

Now focus on the capabilities you used in each of these career episodes. At this point you should be reviewing the sixteen Elements of Competence. Refer to the Indicators of Attainment, as they guide your understanding of the scope envisaged by the corresponding Element. Make notes on your printout where you perceive you have applied the capability explained in “what this competence means in practice” for each Element.

With some Elements, it will be very clear to you where you have used that capability. Others will be less clear. You may find that you have applied certain Elements in each or most career episodes. Other Elements may not have a showing. If this is the case, return to “getting started” and add a career episode for which you used the missing capability.

At this point, select from your career episodes the experience that best demonstrates your capability in each Element. Be selective! You are going to use this experience to persuade the assessors that you have achieved proficiency; that you have the capability to practise without supervision and can help others to develop this capability.

When selecting the work experience to offer as evidence of competence, you should choose contributions to work that has some or all of the characteristics of *engineering problems* or *engineering activities*, as defined in the competency standard for your occupational category. The following scenarios are offered to start your thinking process.

If you are on the PDP pathway you can submit ECCs for competencies that you can already demonstrate, and submit the remainder after you acquire competence and evidence. You do not need to address the Elements in any particular order in the task list in *eChartered*. However, most engineers with less than two years of experience are unlikely to be able to provide a sufficient demonstration of competence in four of the five of the Elements relating to *Technical Proficiency* (12, 14, 15, 16) and *Value in the Workplace* (9, 10, 11) and also Elements 1 and 3 relating to *Personal Commitment*. Elements 5, 6, and 13 will only be able to be addressed by an early career graduate when a relevant project requiring these specific competencies has been undertaken.

2.2 Writing the Claim

Aim to write up your evidence in no more than 700 words per Element.

Applicants are to write persuasively, showing that the capability they contributed to the *engineering activity* or *engineering problem* demonstrates they are proficient in each Element of Competence.

Use narrative; write concisely and in the first person, "I did this". Tell us what you did, why you did it, how and, if relevant, with whom.

If using dot points to list activities, make sure the grammar is consistent and understandable.

Applicants are to expand acronyms (however familiar they may be to them); explain technical terms; avoid jargon; and avoid writing hypothetically or in generalities.

A significant contribution to a project, process or program may cover several Elements. You can use a particular career episode to demonstrate more than one Element, by preparing separate narratives for each Element, each focussing on your contribution that demonstrates that capability. Use specific examples in each narrative. Aim to use at least five or six career episodes across the Elements.

As you write, bear it in mind that you are asking the Chartered Engineers who will read your ECCs to certify personally, to the community and profession, that you are competent to practise independently and unsupervised. They cannot 'safely assume' your competence, or come to a decision on the 'balance of probabilities'; they need to have hard evidence. It is *your* responsibility to provide the evidence, in enough depth and detail (with a maximum of 700 words in each ECC), to leave an engineer Chartered in your Area of Practice with no doubt as to your competence.

An ECC of less than 500 words is unlikely to provide sufficient evidence, in enough depth, to demonstrate that you possess the relevant competence. Note, however, that the issue is *sufficiency* of evidence, not word count alone; do not resort to submitting two weak accounts of career episodes, or padding-out one episode with irrelevant material. The word counter at the bottom of the Claim text box in eChartered is used as the official word counter.

Start each ECC with a brief introduction, including dates, sufficient to provide a context in which your claimed competence is demonstrated. Describe your own actions and decisions, rather than the project itself or what the team did. Write concisely and in the first person singular, describing your own specific actions and decisions ('I did this, and this is how I did it ...' provide the evidence (e.g. describe the outcome) that shows you performed *competently*. To put it another way, tell us what we would have seen if we had been able to be there to see you at work.

If the work you describe was done as part of a team, describe the work that you did, distinguishing it from work done by other team members. Use narrative in preference to bullet points because you should be explaining how you undertake your work, not just listing things you have done. If you need to use bullet points, use them sparingly. Expand acronyms (however familiar they may be to you), explain technical terms, avoid jargon, and use correct grammar and spelling. Avoid writing hypothetically, and merely stating what you were 'responsible for', and don't state general principles of 'what ought to be done'. Instead, state *what* you did, and *why*, and *how*, and *with whom*, and to *what effect*. Don't just imply that you are competent; provide the direct evidence!

If different aspects of your ECC require different verifiers (e.g. it is based on more than one episode, or different aspects of single career episode), you should write them as (up to three) separate parts. These separate parts together make up one ECC (each part goes to a different verifier). While you may base

several ECCs on the same career episode, each ECC must be written to address the relevant competence specifically; i.e. write unique narratives for each Element, even if the same project example is being used and avoid "cutting & pasting".

Finally, ask yourself this question: "Is what I have written *convincing verifiable evidence* of my competence?" Better still: ask someone else the same question. Also think about the assessment principles below:

- *Is it Authentic?* means that you must demonstrate your own *personal* competency; not the competence of your team, or of anyone else.
- *Is it Valid?* means that you have actually and personally *exercised* the claimed competence in dealing with a specific problem or situation, not just that you can give an account of what might have been done in a hypothetical situation.
- *Is it Reliable?* means that you demonstrate that the outcomes of your work are repeatable and not accidental. You must describe how you went about the task, not just the outcome.
- *Is it Current?* means that you are currently competent in the Element of Competency you are claiming. While no time limits are formally specified, the more recent your evidence, the more clearly you can demonstrate that your claimed competency is current. *Generally, the work conducted in the past 8 years will be sufficient to demonstrate all the 16 Elements of Competence. If you need to go back past 10 years, it is advised to contact an Assessor first as to whether the experience would be acceptable as evidence for demonstrating competence.*
- *Is it Sufficient?* means that you provide enough evidence of sufficient quality to allow an assessment of your competence in your Occupational Category – the Engineering Problems or Activities that you have dealt with must be ones that are appropriate to your Area of Practice and your Occupational Category, and you must address all aspects of what each competence means in practice.

If the answer is 'yes', submit the ECC for verification and assessment.

A significant career episode may provide evidence of your competence in several Elements. However, in claiming all 16 *Elements of Competence*, EA Assessors expect you to use at least three separate examples of your work.

The experience that you write about is expected to be post-graduation. Occasionally Assessors will consider some experience gained during a post-graduate course suitable. Permission needs to be sought to claim evidence that is gained whilst completing tertiary studies. This can be done by emailing memberservices@engineersaustralia.org.au and addressing your email to the Lead Division Assessor for (your Division).

2.2.1 Understanding Indicators of Attainment

To write a successful ECC, participants must present evidence which clearly demonstrates the "What this competence means in practice" statement(s) shown in the second column of the Competency Standards. [Where there are two or more statements, all statements need to be demonstrated.] The purpose of Indicators of Attainment is to assist participants in the selection of appropriate project examples to use as evidence for demonstrating the meaning of a Competency Element.

In addition, Indicators of Attainment assist in understanding the scope of an Element by providing illustrations of a variety of relevant engineering work.

Indicators of Attainment are not therefore assessment criteria, rather they are guides.

In order to sufficiently demonstrate a Competency Element, a participant may need to draw on more than one project example reflecting different Indicators of Attainment, or some other type of appropriate project experiences.

Questions may arise at workshops or when you are reading the Competency Standards relating to 'how many' or 'minimum numbers' of Indicators of Attainment required to be written about. The answer is, there is no minimum, as relevant project experience is not limited to the listed Indicators of Attainment, rather they serve as a guide to the type of work that is likely to demonstrate the Element.

2.3 Examples

Some examples are provided below to illustrate how some of the things engineers do demonstrate their capability across a range of Elements of Competence. The examples also illustrate the nature of work and responsibility expected of applicants. Other specific narrative examples taken from applicants who have successfully become Chartered using the 2012 Competency Standards are also available on the website

Example 1

The following scenario is an example of an applicant's contribution to *engineering activities* that could have significant consequences in a range of contexts, characterised by difficulty of prediction and mitigation.

A chemical engineer, involved in the concept design of fluoride dosing equipment for installation in the water treatment plant for remote communities. Since the applicant contributed substantially to the conceptual design, several elements would be satisfied:

- Responsibility for engineering activities (3) by engaging with peer review to propose equipment that could be operated simply, safely and reliably
- Meet legal and regulatory requirements (7) where legislation and codes of practice regulate handling, storage, containment, dosing and monitoring of chemicals
- Creativity and innovation (15) to avoid a concentration spike immediately following filter backwash procedures by including a suitable dosing pause.

Example 2

The following scenario is an example of an applicant's contribution to the solution of *engineering problems* that involved wide-ranging or conflicting technical, sociological or environmental requirements.

A civil engineer studying the feasibility of a dam for a populated area could describe aspects of construction material selection, community consultation regarding their relocation or operational safety provisions and consideration of the upstream and downstream ecological consequences of filling the dam. Provided the applicant contributed to all these aspects, the feasibility study could satisfy several elements:

- Local engineering knowledge (13) of materials sourcing, haulage costs, equipment hire, control and testing and remediation of borrow pits
- Engagement with community and stakeholders (5) over relocation, compensation and protection from future flood events
- Safe and sustainable solutions (4) through the development of a costed environmental conservation plan and dam operating procedures.

Example 3

The following scenario is an example of an applicant's contribution to engineering activities that involved creative use of engineering principles and knowledge, much of which is at, or informed by, the forefront of a practice area.

An environmental engineer, involved in research and teaching (an academic), providing advice and direction on policy development related to sustainability in the energy sector. Since the applicant contributed substantially to improved policy, several elements would be satisfied:

- Advanced engineering knowledge (12) by listing research papers the applicant has published in the practice area
- Creativity and innovation (14) in developing teaching materials and website portals integrating information deriving from the research
- Performance (9) by negotiating and completing specific research in collaboration with laboratories, academic colleagues and funding agencies to further the development of policy
- Engage with relevant community and stakeholders (5) by listing reports that have required in-depth consultation with various communities and stakeholders during the development of improved policy positions.

Example 4

The following scenario is an example of an applicant's contribution to engineering activities that require resolution of significant problems arising from interactions between wide-ranging or conflicting technical, sociological, environmental or other requirements.

A biomedical engineer, involved in the acquisition of complex medical devices for use in a hospital environment. Since the applicant contributed substantially to the decision making process, several elements would be satisfied:

- Communication (8) through involvement in a multi-disciplinary purchasing panel of clinicians, administrators, OHS, patient safety and maintenance officers, with whom the applicant's role was interpreting issues into engineering terms that could be explained to each in language they understood
- Dealing with ethical issues (1) by ensuring all tendering parties had access to all relevant information and requirements and resisting pressure to change tender evaluation reports to suit preconceived preferences from senior staff
- By accessing, acquiring and applying competencies and resources to the verification of equipment test results (2) when confronted with medical equipment that was failing an electrical safety test at the time it was needed for a medical procedure.

Example 5

The following scenario is an example of an applicant's contribution to the solution of *engineering problems* that have no obvious solution and require abstract thinking and originality in analysis to formulate suitable models.

A software engineer, overseeing all engineering process areas in an organisation, develops a risk management plan which describes the strategies and processes to identify, evaluate and manage risk. Since the applicant contributed substantially to the plan and related procedures, several elements would be satisfied:

- Identify, assess and manage risks (6) as part of the analysis of business, technological, project, security and OHS risks against the AS/NZS Standard and the regulatory framework under which the organisation operates. The applicant introduced risk analysis and documentation of risk-based process to the assessment, design and implementation of engineering change management

- Taking action (10) by writing, reviewing, approving and updating engineering and technical procedures to be incorporated within the organisation's engineering management system and monitoring conformance in association with the quality manager
- Judgement (11) exercised when particular hazards were identified as catastrophic brought in technical expertise from another engineering discipline to mitigate the risk by introducing safety precautions



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