



Engineers New Zealand

Engineers Mobility Forum Agreement

And

APEC Engineer Agreement

Updated Assessment Statement

New Zealand

May 2005

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1.0 Introductory Notes

1.1 Overview

New Zealand (through the Institution of Professional Engineers New Zealand – IPENZ) applied and gained acceptance to the APEC agreement through presentation of an Assessment Statement prepared in October 1999. Entry to the Engineers Mobility Forum Agreement was gained through acceptance of an Assessment Statement prepared in March 2001. This latter document was based on the earlier APEC statement. The main differences were in the governance area, with the former having Government involvement in the Monitoring Committee, and the latter being governed solely by IPENZ.

At the time of presentation of both Assessment Statements IPENZ signalled the intention of the New Zealand Government to introduce new legislation for the registration of professional engineers in New Zealand. That Act (the Chartered Professional Engineers of New Zealand Act 2002) was enacted on 1 July 2002, and the new register opened on 1 January 2003. In order to meet the requirements of the Act, IPENZ had to make changes to some of its procedures, and these were reflected in the revised assessment statement approved at the International Engineers Meeting held in Rotorua in June 2003. Further minor regulatory changes were introduced on 1 January 2005, which has resulted in further adjustments being made to fine tune processes and associated documentation. There has been no change in the standard of competence required for the registration of professional engineers since the IEM meetings in June 2003.

1.2 The Chartered Professional Engineers Act 2002

The Chartered Professional Engineers Act 2002 (Attachment 4) appoints IPENZ as the Registration Authority for registering competent persons as Chartered Professional Engineers (CPEng) in New Zealand. IPENZ is required to run the register, to assess applicants, hear complaints and undertake any necessary disciplinary actions. The Chartered Professional Engineers Council, appointed by Government to ensure that the Act is properly implemented, audits the performance of IPENZ.

The Act requires IPENZ to develop three standards after consultation and taking into account international best practice – a standard of competence (including knowledge and skills) for initial registration, a standard for demonstrating current competence (including the frequency at which current competence will be assessed), and a minimum code of ethical conduct to be observed by registered persons.

There is no provision to automatically transfer previously registered persons to the new CPEng register – each applicant must apply and demonstrate their competence before being registered as a CPEng. Once on the register, each registrant must, at periods not exceeding 5 years, present evidence of their continued competence to remain on the register. It is not sufficient under the Act to prove that one has engaged in continuing professional development (CPD) to maintain one's registration. Rather the person must pass a higher test – that they can demonstrate current competence - to remain registered. In passing the legislation Parliament took the view that demonstration of participation in CPD was not a good proxy for having maintained current competence and thus required regular revalidation of competence. CPD records are a form of evidence towards demonstration of current competence but a fuller assessment, which includes assessment of items such as referees' reports, work history reports and even work samples, is required.

1.3 Impact of the CPEng Act on IPENZ's Implementation of the APEC and EMF Agreements

The impacts can be summarised as follows:

Requirement under APEC and EMF Agreements	Changes Made (and Agreed at IEM 2003)
Completed an Accredited Engineering Programme or recognised equivalent	No change
Assessed as eligible for independent practice	Revised assessment statement incorporates the more rigorous competence assessment process required for CPEng
Gained 7 years post-graduation experience	No change
Spent 2 years in responsible charge	No change
Maintained satisfactory continuing professional development	Revised assessment statement incorporates a more rigorous process in the form of regular competence review
Compliance with Code of Ethics	No Change

The New Zealand sections of the EMF and APEC Engineers Registers are being operated as a combined register denoted as the "New Zealand Section of the International Professional Engineers (IntPE) Register" created under the APEC Engineer and EMF Agreements. This assessment statement is applicable for the combined register and, apart from minor changes noted above, has been approved by both the EMF and APEC Engineer Coordinating Committees.

1.4 Implementation Changes

The new IntPE register was opened on 1 January 2003, and IPENZ made its first registrations in early 2003. It is the view of IPENZ that the changes made to the 2003 Assessment Statement have been to lift the standard of assessment since the previous Assessment Statements were prepared..

Applicants for entry to the IntPE Register can be split into two groups - those who have not been previously assessed, and those who have been previously assessed by IPENZ . The former group are subject to both a desk check of a portfolio of evidence and then an interactive assessment. The latter group are subject to a desk check of their portfolio of evidence and are only required to undertake an interactive assessment if the assessment panel is of the view that the portfolio of evidence does not demonstrate that the applicant meets the standard for initial registration.

New Zealand engineers are identified on the Int PE Register under the following engineering practice fields (the term 'practice field' is used in preference to 'discipline' in NZ):

Aerospace	Chemical	Fire	Mechanical
Bio	Civil	Geotechnical	Mining
Building Services	Electrical	Industrial	Petroleum
Business	Environmental	Information	Structural

1.5 APEC Engineer

The agreement with the New Zealand Government has been updated following the enactment of the Chartered Professional Engineers Act (2002). The key features of that agreement are that:

1. The Chief Executive of IPENZ will be the NZ representative at international meetings in respect of APEC Engineer
2. The APEC Monitoring Committee will be the Competence Assessment Board (CAB) of IPENZ, augmented by the NZ representative and this group will be charged with all operational matters associated with the register.

3. There will also be an APEC Engineer Policy Reference Group comprising the NZ representative, a representative of Ministry of Foreign Affairs and Trade (from the Trade Negotiations Division), a representative of the Ministry of Economic Development, the Chair of the APEC Monitoring Committee and a representative of the Association of Consulting Engineers New Zealand. This would meet on demand, in advance of APEC Engineer international meetings.
4. The Registrar of IPENZ will be the secretary to both the Monitoring Committee and Reference Group.
5. The role of the APEC Engineer Policy Reference Group will be to develop policy papers proposed for submission by New Zealand to, and review agenda papers received in respect of, APEC Engineer international meetings in advance of such meetings, and to provide a briefing to the New Zealand representative on the New Zealand position on policy matters.
6. On any specific issue where an official Government view is needed to be put, either Ministry will arrange this through attendance by a government representative, along with the industry representative, or provide the NZ industry representative with an appropriate letter of representation to make it clear that the NZ industry representative has authority to present a Government position in respect of the specific issue concerned.

This revised Assessment Statement has been prepared under the auspices of the Monitoring Committee because it is not a policy matter.

1.6 Remaining Parts of this Document

The remaining part of this document contains the full assessment statement, including those parts approved as changes in 2003 and the earlier unchanged parts approved in 1999 and 2001. Reference is made to the CPEng Act (*Attachment 4*) and Rules (provided as *Attachments 5* and *6* for detail).

2.0 Governance

2.1 EMF Agreement

IPENZ is the signatory to the EMF Agreement and actions in respect of the Agreement are therefore the responsibility of the IPENZ governing Board. That Board has made delegations to the Chief Executive, Competence Assessment Board and Standards and Accreditation Board for development and approval of this Assessment Statement.

2.2 New Zealand Monitoring Committee (APEC Engineer)

The New Zealand Monitoring Committee currently consists of the Competence Assessment Board (as outlined in the CPEng Rules, Rules 77 to 79) and the Chief Executive of IPENZ. Members at 1 May 2005 are:

Chair	Paul Wilson
Members	Andrew Collow Greg Lowe Murray Brown Ross Major (IPENZ Board representative) Basil Wakelin (Chair of Standards and Accreditation Board) Andrew Cleland (Chief Executive IPENZ)
Secretary:	Jeff Wastney (Registrar, non-voting)

3.0 Initial Assessment Mechanisms

3.1 Accreditation or Recognition of Higher Engineering Education Programmes

3.1.1 IPENZ Accredited Degrees or Equivalent

IPENZ is a signatory to the Washington Accord Agreement and thereby accredits four year engineering degrees to the standard set through this Agreement. This standard is defined in the IPENZ policy document "Requirements for Initial Academic Education for Professional Engineers" is in *Attachment 1*. Each accredited engineering education provider undergoes an accreditation visit normally every five years. The accreditation process is defined in the IPENZ Accreditation Manual is attached in *Attachment 2*. IPENZ maintains a list of engineering degrees that have gained IPENZ Accreditation is attached in *Attachment 3*. IPENZ accepts, as meeting the academic requirement for professional engineers, all qualifications that fall within the Washington Accord Agreement.

3.1.2 Alternative Assessment Mechanisms

If an engineer has gained his/her engineering qualifications outside of New Zealand and in a country *not* represented by the Washington Accord Agreement, there are two alternative qualification assessment procedures that are acceptable for IPENZ membership and registration:

- (a) *Post graduate engineering qualification from a New Zealand tertiary education provider that delivers IPENZ accredited four-year engineering degrees*

On completion of the engineering post graduate qualification, the engineer can request that the Associate Dean or Dean of the School of Engineering assess whether the combination of the engineer's qualifications ie their initial degree and their post graduate qualification, is at least equivalent to a New Zealand IPENZ accredited four-year engineering degree.

(b) *New Zealand Qualifications Authority (NZQA)*

One of the services of this government department is the assessment of overseas qualifications. Since July 1997 NZQA has benchmarked engineering degrees to the NZ four-year engineering degree and makes a specific statement to this effect on the Qualification Assessment Form for IPENZ membership and registration purposes. IPENZ continues to monitor the qualification assessment outcomes and is satisfied that the NZQA qualification assessments are accurately benchmarked to NZ four-year engineering degrees which are accredited by IPENZ.

3.2 Assessment for Independent Practice

3.2.1 Overview

The assessment mechanism for engineers for independent practice is competence-based and conducted by IPENZ to satisfy the requirements for entry into the class of Professional Member (MIPENZ) and for initial registration on the Chartered Professional Engineers Register. All applicants for the IntPE register under either APEC Engineer or EMF Agreement must demonstrate their competence immediately prior to registration on the NZ section of IntPE.

The CPEng Rules, and rule changes introduced on 1 January 2005, set out the standards and the procedures for competence assessment. Rules 6 and 7 set out the competence standard to be met and Rules 10-15 describe the assessment processes. In applying Rule 6 for applicants for IntPE IPENZ need not consider Rule 6(2)(a)(ii) which is specific to New Zealand. Assessments involve three elements:

- assessment of a portfolio of written evidence by an assessment panel
- interactive assessment where the candidate engages in professional conversation with the assessment panel
- a written assignment set by the assessment panel.

The panel can decline to use the second and/or third assessment tools if it can reach a decision without them. It can also require the candidate to supply further evidence such as work samples and further referees' statements.

For practical purposes three groups of candidates are processed differently:

- those who have never passed an IPENZ-recognised competence assessment – these candidates must undergo both the first two types of assessment, and may be required to undergo the third
- those who have passed an IPENZ-recognised competence assessment within the six months prior to the date of application – in these cases no further assessment is performed other than to ensure that there have been no concerns over the candidate's ethical behaviour.
- All others (i.e. those who have undergone an IPENZ-recognised competence assessment more than two years previously) must submit a full portfolio of written evidence – some of these cases will be required to undergo the second and third types of assessment.

In respect of the above categorisation, IPENZ-recognised competence assessments are taken to be those conducted under the jurisdiction of any of the members of either the APEC Engineer or EMF Agreement.

Each candidate is assessed against Rule 6 of the CPEng Rules which requires that they demonstrate at the time of application they are able to practise competently. In effect, it is a zero base assessment. Successful previous competence assessments are a form of valid evidence, but insufficient in themselves. The longer ago a previous competence assessment was (irrespective of whether it was by IPENZ or in another jurisdiction), the less weight that can be given to it as a piece of evidence, and the more consideration that will be given to recent evidence

such as CPD records, work samples and referee reports. The onus is on the candidate to present the best evidence they can provide to demonstrate that they meet the competence standard.

3.2.2 Structure of Application

CPEng Rule 8(2) and Rule 9 set out the information required from the applicant. This includes qualifications, evidence of achievement in previous competence assessments, names of competent referees, professional development activities undertaken, a work history, any information the candidate wishes to provide (which may include work samples), a statement of self-review plus annotations that show how the competence standard in Rule 6 is met. The Assessment Panel can request further information under Rule 11.

IPENZ makes available a variety of guidelines and forms to assist in preparing evidence in a relatively standardised way, however, the way that the CPEng Rules are written allows candidates to present evidence as they wish. Forms available are:

- *Handbook for Applicants Seeking Formal Recognition of Competence as a Professional Engineer (PR100)*
- *Competence Assessment Application Form (PR105)*
- *Work History Summary Form (PR140)*
- *CPD Activities Summary Form (PR150)*
- *Self Review Form for Competence Assessment (PR160)*
- *Referee Declaration and Evaluation Form (PR170)* to be submitted by referees;
- *Summary of Responsibility for Complex Engineering Activities Form (PR180)*

The forms are available at <http://www.ipenz.org.nz/ipenz/forms/pdfs/?CFID=279695&CFTOKEN=57954766>, and copies are provided as Attachments.

3.2.3 Appointment of Assessors and Evaluation of Written Evidence

Assessors are appointed under Rule 75. Each Assessment Panel includes a trained staff assessor who is contracted on a fee for service basis by IPENZ and who is responsible for ensuring consistency with other Panels, plus recording the outcomes. The panel also includes at least one other assessor who must have knowledge or experience relevant to the practice area in which the applicant is being assessed. All assessors have undergone training – typically a minimum of two days for staff assessors and one-day for the other assessors (Practice Area Assessors). Training is regarded as being up-to-date for 3-5 years. The use of the concept of a part-time contract assessor (the Staff Assessor) was introduced to the assessment process following the implementation of CPEng to improve the consistency and reliability of assessments.

The assessment panel confer and evaluate the evidence against the elements of the standard in Rule 6. It then decides whether to request further information or to bring the applicant to interactive assessment and complete a written assignment before producing a report and recommendation to CAB.

3.2.4 Interactive Assessment

The specific purposes of the interactive assessment are to assess the applicant's personal attributes and ability to effectively communicate orally in the English language, and look for elaboration and verification of material submitted, particularly on issues where the applicant may not have clearly demonstrated in the documentation provided, that they meet particular "elements" of the competence standard. The interactive assessment is applicant-led – a professional conversation between applicant and assessors which draws out the evidence from the applicant. Applicants make a short presentation to commence, and then the assessors use leading questions to assist the applicant to demonstrate their competence. The process may be as short as 45 minutes, but can be well over an hour. An interactive assessment can continue at a later time – for example at a later time by

teleconference, or even in a different venue e.g. the applicant's office where work samples can be seen and discussed.

3.2.5 Written Assignment

The written assignment provides panels with an additional mechanism to investigate the skills and knowledge of the applicant in specific areas, and may take different forms depending on the areas of competence the panel wishes to explore in greater depth. The written assignment can be the traditionally used essay - in such cases applicants sit a three hour essay assessment. The essay topic is set by the assessment panel after completion of the interactive assessment so that the panel can probe specific areas of competence in further depth. Applicants are not informed of their essay topic until they enter the assessment, and each applicant receives a different essay topic. The essays are reviewed by the applicant's assessment panel. One purpose of an essay is to assess how well an applicant can produce a clear, well structured, written presentation on a given subject within a set time.

Alternatively, a written assignment can be a 'take away' problem to be solved using resources at the applicant's place of work – for example if there is doubt over a specific technical competence, an assignment to test for it could be set. Other possible examples include case studies and work simulations.

3.2.6 Reporting and Decision Making

The panel produces an assessment report and a recommendation to the CAB, which must make decisions in accordance with Rules 12 -15. Natural justice provisions require that if the CAB intends to decline an application, it must first inform the applicant and give him or her the opportunity to provide a further written submission, which the CAB must consider when making its decision. Thus there is considerable opportunity for the applicant to ensure that their best evidence is presented and properly assessed.

3.2.7 Assessment Reports

Assessment Panels prepare detailed documentation (using a PR401 form) giving reasons for their decisions. These reasons are available to the applicant. The panel has powers to request additional information or details of additional referees from applicants, combine or repeat steps using the different assessment tools process or take other steps to complete the assessment.

3.2.8 International Benchmarking of the Competence Standard

A requirement on IPENZ under the CPEng Act in preparation of the outcomes-based assessment standard is to take into account international best practice. In this IPENZ sought to build on the outcomes-based standards used in the UK and Australia. The final standard was supported as reasonably conforming to international best practice by three other members of the EMF Agreement. The standard with performance indicators, as approved at the International Engineers Meeting in June 2003, is included as Appendix 1.

3.2.9 Practice Field/Engineering Discipline

In New Zealand neither professional membership of IPENZ nor registration is practice field (discipline) specific. For assessment purposes applicants are assessed within their practice area, which is defined in the CPEng Rules as a combination of the areas in which they have specialist knowledge/skills and the nature of their professional engineering activities. Applicants are asked to identify one (but no more than two) practice fields (or disciplines – from the list agreed for the APEC Engineer Register) with which their practice area best aligns. The applicants' engineering practice field(s) is normally the same engineering discipline as their initial academic qualification, however, there may be some variance to this if applicants have undergone post-graduate education and training in more specialised fields of engineering. For example, an applicant may have a civil engineering degree but, through postgraduate education and training, specialised in structural engineering and be eligible to be assessed in this field of engineering.

For each applicant the practice field(s) within which he/she has demonstrated his/her competence is recorded. It may be possible for applicants to demonstrate their competence within more than one primary practice field in which case both fields are recorded.

3.2.10 Approval Conditions

Applicants sign a declaration on the application form (PR105) agreeing to abide by the relevant code of ethics – for IntPE this is the IPENZ Code rather than the CPEng Code which is embedded in the CPEng Rules (Rules 43 to 53). This requirement (and the IPENZ Code of Ethics, refer to Appendix 3) is unchanged from the previous assessment statements.

3.2.11 Appeal Provisions

Applicants who have had their applications declined are able to apply for a reconsideration if they consider that they have been disadvantaged by a procedural error in the assessment process.. The applicant must lodge his/her application within a specified period of time after being notified of the decision and state how he/she believes that the assessment of his/her application did not follow the procedure, and how this error disadvantaged him/her. IPENZ will then appoint an independent reviewer (with suitable qualifications) to complete the review. If the reviewer finds that there was a procedural error, the reviewer can direct IPENZ to recommence the assessment at that point, otherwise the reviewer must dismiss the application for review.

3.3 Specific requirements for Entry onto the IntPE Register

3.3.1 Seven years professional engineering experience

The assessment panel uses the Work History Summary to verify that the candidate has completed seven years of post graduation work. The work history must be verified, usually by other professional engineers who hold CPEng or CPEng equivalence (i.e. are similarly competent). If the panel has doubts, it can contact the referees, who must be CPEng registered or have CPEng equivalence (refer to Appendix 2), for clarification.

3.3.2 Two years Experience in Responsible Charge of Significant Engineering Work

The panel reviews the Summary of Responsibilities for Complex Engineering Activities to verify that the candidate has had at least two years in responsible charge of significant engineering work. The panel can contact the referees for clarification.

3.3.3 Compliance with Code of Conduct

All engineers registered by IPENZ on the IntPE Register are bound by the IPENZ Code of Ethics and the Disciplinary Regulations that underpin it. Applicants complete a signed statement agreeing to be bound by the IPENZ Code of Ethics as well as the code of ethics set and enforced in each EMF jurisdiction within which they are practising, and to be held individually accountable for their actions, both through requirements imposed by the registering body in that jurisdiction and through legal processes.

4 Ongoing Competence Assessment

The Rules for CPEng require that each registered person demonstrate his/her current competence at intervals not exceeding five years – the period until next assessment is set by the CAB as part of the decision making process. There are two parts to this standard (Rule 20) – a requirement to demonstrate that he/she is still able to practise competently to the standard of a reasonable professional engineer, and a requirement that he/she has taken

reasonable steps to maintain the currency of his or her professional engineering knowledge and skills within his/her practice area.

The first requirement requires demonstration that the registrant's professional engineering activities since his/her last assessment have been to a satisfactory standard, and the second requirement focuses on his/her CPD. In preparing for revalidation, the registrant is expected to focus not on the volume of CPD but on the relevance and effectiveness of CPD to his/her practice area. The registrant has to demonstrate how his/her skills and knowledge have been maintained.

The on-going competence assessment process is in effect a repetition of the process for initial registration (presentation of a very similar evidence portfolio, desk check, interactive assessment and written assignment if required). Rules 22-30 describe the procedures. The key items of evidence are expected to be declarations from referees, CPD records and recent work samples.

The CPEng Rules also allow for IPENZ to assess any particular registrant at any time. If concerns are raised about the competence of a registrant, that person can be required to undergo re-assessment.

IntPE registrants who demonstrate current competence through this process will be deemed to have demonstrated ongoing eligibility for independent practice and satisfactory continuing professional development. As a result they will remain eligible for IntPE registration. Failure to demonstrate current competence will result in removal from the IntPE Register.

5 Quality Assurance

There are a number of features incorporated into the process that are intended to provide a high quality competence assessment.

- i. Applicants are asked to produce self-reviews. This provides applicants with an opportunity to reflect on the evidence they have provided and how that demonstrates competence to peers. It also provides an opportunity to consider any developmental action to maintain competence.
- ii. All assessors undergo training. Staff Assessors have regular training workshops (typically one or two per year), while Practice Area Assessors undergo a one-training session before doing assessments, with re-training scheduled once every two to three years.
- iii. Staff Assessors are contracted 20% to 30% of their time. This is on a 'fee for service' basis, which typically involves regular assessment work and enables them to attain a high level of consistency in assessment.
- iv. Exemplars are provided to applicants and assessors to assist in production of good evidence and assessment of that evidence.
- v. Multiple assessment tools are used in the assessment. Assessors are empowered to use additional tools for specific cases where this will assist in completing an assessment.
- vi. Rule 11(1)(e) allows Assessment Panels to receive advice from a member of the Competence Assessment Board for assisting in making a recommendation on difficult cases. Assessment Panels are not the final decision maker – they make recommendations to the Competence Assessment Board (CAB) which is the final decision maker on applications of competence. The CAB considers recommendations, can request they be reconsidered, and ultimately can over-rule the Assessment Panel. The presence of staff assessors performing significant numbers of assessments and building of relationships with the Board assists in achieving consistency and uniformity in judgements.
- vii. The Registrar's role in developing regulations and competence standards coupled with an overview of assessments provides a linkage between legal requirements and practicalities of

- producing portfolios of evidence. The Registrar is responsible for production of handbooks, guidelines and application forms.
- viii. The Assessment Quality Manager vets all assessment reports prior to presentation to CAB, and provides feedback to assessors on the quality of their recommendations and documentation as a form of moderation.
 - ix. Annual reports to the CPEng Council.
 - x. Information sharing with Engineers Australia (with possible benchmarking).
 - xi. CAB initiated internal audits.

Appendix 1 - Professional Engineering Competencies

Format of Competency Standard for Professional Engineers

The "Competency Standard for Professional Engineers" consists of the following:

- *12 elements*: these represent broad areas of professional engineering performance. Taken holistically these elements make up the minimum standard for registration as outlined in the CPEng Rules. (in the Standard below, the elements are numbered and printed in bold).
- *performance indicators*: these provide further detail as to the meaning of each element thereby enabling applicants and assessors to have a clearer understanding of the performance required to demonstrate competency in each element. They are important indicators of competence but are not criteria that need to be met nor are they an exhaustive list. Performance indicators are identified by bullet points, and are not part of the standard.
- *definition*: these provide a critical component of the standard and need to be considered carefully by applicants when they are preparing their portfolio of evidence to demonstrate they meet the competency standard.

The Competency Standard

To meet the minimum standard a person must demonstrate that he/she is able to practice competently in his/her practice area to the standard of a reasonable professional engineer.

The extent to which the person is able to perform each of the following numbered elements in his/her practice area must be taken into account in assessing whether or not he/she meets the overall standard.

1 Comprehend, and apply knowledge of, accepted principles underpinning widely applied good practice for professional engineering

- Has a Washington Accord degree or recognised equivalent qualification or has demonstrated equivalent knowledge and is able to:
- Identify, comprehend and apply appropriate engineering knowledge
- Work from first principles to make reliable predictions of outcomes
- Seek advice, where necessary, to supplement own knowledge and experience
- Read literature, comprehend, evaluate and apply new knowledge

2 Comprehend, and apply knowledge of, accepted principles underpinning good practice for professional engineering that is specific to the jurisdiction in which he/she practices (For CPEng assessment this relates to the jurisdiction of NZ)

- Demonstrates an awareness of legal requirements and regulatory issues within the jurisdictions in which he/she practices
- Demonstrates an awareness of and applies appropriately the special engineering requirements operating within the jurisdictions in which he/she practices

3 Define, investigate and analyse *complex engineering problems* in accordance with good practice for professional engineering

- Identifies and defines the scope of the problem

- Investigates and analyses relevant information using quantitative and qualitative techniques
- Tests analysis for correctness of results
- Conducts any necessary research and reaches substantiated conclusions

4 Design or develop solutions to *complex engineering problems* in accordance with good practice for professional engineering.

- Identifies needs, requirements, constraints and performance criteria
- Develops concepts and recommendations that were tested against engineering principles
- Consults with stakeholders
- Evaluates options and selects solution that best matched needs, requirements and criteria
- Plans and implements effective, efficient and practical systems or solutions
- Evaluates outcomes

5 Be responsible for making decisions on part or all of one or more *complex engineering activities*

- Takes accountability for his/her outputs and for those for whom he/she is responsible
- Accepts responsibility for his/her engineering activities

6 Manage part or all of one or more *complex engineering activities* in accordance with good engineering management practice

- Plans, schedules and organises projects to deliver specified outcomes
- Applies appropriate quality assurance techniques
- Manages resources, including personnel, finance and physical resources
- Manages conflicting demands and expectations

7 Identify, assess and manage engineering risk

- Identifies risks
- Develops risk management policies, procedures and protocols to manage safety and hazards
- Manages risks through 'elimination, minimisation and avoidance' techniques

8 Conduct engineering activities to an ethical standard at least equivalent to the relevant code of ethical conduct

- Demonstrates understanding of IPENZ and/or CPEng codes of ethics
- Behaves in accordance with the relevant code of ethics even in difficult circumstances (includes demonstrating an awareness of limits of capability; acting with integrity and honesty and demonstrating self management)

9 Recognise the reasonably foreseeable social, cultural and environmental effects of professional engineering activities generally

- Considers and, where needed, takes into account health and safety compliance issues and impact(s) on those affected by engineering activities

- Considers and takes into account possible social, cultural and environmental impacts and consults where appropriate
- Considers Treaty of Waitangi implications and consults accordingly
- Recognises impact and long-term effects of engineering activities on the environment
- Recognises foreseeable effects and where practicable seeks to reduce adverse effects

10 Communicate clearly with other engineers and others that he or she is likely to deal with in the course of his or her professional engineering activities

- Uses oral and written communication to meet the needs and expectations of his/her audience
- Communicates using a range of media suitable to the audience and context
- Treats people with respect
- Develops empathy and uses active listening skills when communicating with others
- Operates effectively as a team member

11 Maintain the currency of his or her professional engineering knowledge and skills

- Demonstrates a commitment to extending and developing knowledge and skills
- Participates in education, training, mentoring or other programmes contributing to his/her professional development
- Adapts and updates knowledge base in the course of professional practice
- Demonstrates collaborative involvement with professional engineers (NZ engineers for CPEng assessments)

12 Exercise sound professional engineering judgement

- Demonstrates the ability to identify alternative options
- Demonstrates the ability to choose between options and justify decisions
- Peers recognise his/her ability to exercise sound professional engineering judgement

Definitions:

i Practice Area

Quoting the CPEng Rules:

practice area means an engineer's area of practice, as determined by—

- (a) the area within which he or she has engineering knowledge and skills; and
- (b) the nature of his or her professional engineering activities.

The **practice area** is a combination of both the area in which the engineer holds specialised engineering knowledge and the nature of the activities performed, and one or both of these may change over the course of professional life. The competence of the applicant will be assessed in his/her **current** area of engineering practice.

ii Complex engineering activities

Complex engineering activities means engineering activities or projects that have some or all of the following characteristics:

- Involve the use of diverse resources (and, for this purpose, **resources** includes people, money, equipment, materials and technologies);
- Require resolution of critical problems arising from interactions between wide-ranging technical, engineering and other issues;

Have significant consequences in a range of contexts;

Involve the use of new materials, techniques, or processes or the use of existing materials, techniques, or processes in innovative ways.

iii **Complex engineering problems**

Complex engineering problems have some or all of the following characteristics:

- Involve wide-ranging or conflicting technical, engineering, and other issues;
- Have no obvious solution and require originality in analysis;
- Involve infrequently encountered issues;
- Are outside problems encompassed by standards and codes of practice for professional engineering;
- Involve diverse groups of stakeholders with widely varying needs;
- Have significant consequences in a range of contexts;
- Cannot be resolved without in-depth engineering knowledge.

iv **Knowledge Specific to Local Jurisdictions**

Applicants will need to provide evidence that, within the jurisdictions in which they work, they:

- Understand the general principles behind applicable codes of practice;
- Have demonstrated a capacity to ensure such principles are applied safely and efficiently; and
- Are aware of the special requirements operating within the host jurisdiction.

v **Methods of Analysis**

The techniques used in quantitative analysis will vary depending on the field of engineering practice however they include computer, mathematical or reliability modelling, statistics, and the use of planning tools.

vi **Design and Development**

Design and development are a conceptual processes used to bring together innovation, aesthetics and functionality to plan and create an artefact, product, process, component or system to solve a complex engineering problem. The design or development process may develop the shape, size and selection of material and components for engineering products/outcomes.

Design and development also include engineering planning, an example of which is the process of locating facilities and items of engineering construction taking into account all the factors affecting their relationship and their inter-relationships with the external environment.

vii **Responsibility for Making Decisions for Complex Engineering Activities**

Applicants may be taken to have been **responsible for making decisions for complex engineering activities** when they have:

- Planned, designed, co-ordinated and executed a (small) project; or
- Undertaken part of a larger project based on an understanding of the whole project;
- Or undertaken novel, complex or multi-disciplinary work.

Appendix 2 – CPEng Equivalence

CPEng equivalence means a qualification that requires competence at least equivalent to that required of a Chartered Professional Engineer.

It requires

- (i) attainment of competence to the CPEng standard; and
- (ii) reasonable evidence that the competence is current.

As the rule is currently interpreted, to demonstrate CPEng equivalence a person must:

1. have undergone a competence assessment to the same standard as CPEng, as evidence by either of
 - a. registered on the International Professional Engineers Register in any jurisdiction
 - b. Professional Membership of IPENZ or an equivalent professional body; or registration which requires competence assessment meeting the standard implied by the Engineers Mobility Forum and APEC Engineers agreement
2. provide evidence of currency in the form of proof of
 - a. having undergone a competence assessment as described above in the last five years
 - b. membership of a professional body or registration which requires compliance with a code of ethical conduct that includes active participation in CPD to maintain competence, and proscribes practicing beyond one's current competence; and being actively engaged in professional engineering activities.

The acceptance of CPEng equivalence will be determined by the Registrar on a case-by-case basis.

Appendix 3 – Institution of Professional Engineers of New Zealand Code of Ethics

The Code of Ethics is based on the five fundamental ethical values set out in Rule 4 of the Institution as follows:

- Protection of life and safeguarding people
- Sustainable management and care for the environment
- Commitment to community well-being
- Professionalism, integrity and competence
- Sustaining engineering knowledge

The Code consists of three Parts. The first is a set of five fundamental ethical values. These values are intended to inform Members of the high ideals of professional life. Part II provides expanded guidelines. These guidelines are not exhaustive - they are offered as a guide to the understanding and intentions of Part I. They should be read with Part I as a whole and given a free and liberal meaning. They range from exhortations to excellence to prescriptive directions as to what constitutes ethical professional behaviour. Part III sets out the minimum standards of behaviour against which the behaviour of Members will be judged in terms of deciding if they have reasonably complied with the requirement in Rule 4 of the Institution to behave ethically.

Members will find in the three Parts assistance in deciding the proper response to most of the situations they will meet in their professional life. In the final analysis, the judgement of the Member's peers as to what the 'reasonable professional' would have done faced with the same situation and applying the same provisions in Part III will prevail.

The Institution may issue information such as definitions of terminology to further assist Members interpret the Code. Such information does not form part of the Code.

Part 1 - Values

Protection of Life and Safeguarding People: Members shall recognise the need to protect life and to safeguard people, and in their engineering activities shall act to address this need.

Professionalism, Integrity and Competence: Members shall undertake their engineering activities with professionalism and integrity and shall work within their levels of competence.

Commitment to Community Well-being: Members shall recognise the responsibility of the profession to actively contribute to the well-being of society and, when involved in any engineering activity shall endeavour to identify, inform and consult affected parties.

Sustainable Management and Care for the Environment: Members shall recognise and respect the need for sustainable management of the planet's resources and endeavour to minimise adverse environmental impacts of their engineering activities for both present and future generations.

Sustaining Engineering Knowledge: Members shall seek to contribute to the development of their own and the engineering profession's knowledge, skill and expertise for the benefit of society.

Part 2 - Guidelines

Protection of Life and Safeguarding People: Members shall recognise the need to protect life and to safeguard people and in their engineering activities shall act to address this need. Under this clause you should have due regard to:

- 1.1 Giving priority to the safety and well-being of the community and having regard to this principle in assessing obligations to clients, employers and colleagues.
- 1.2 Ensuring that reasonable steps are taken to minimise the risk of loss of life, injury or suffering which may result from your engineering activities, either directly or indirectly.
- 1.3 Drawing the attention of those affected to the level and significance of risk associated with the work.
- 1.4 Assessing and taking reasonable steps to minimise potential dangers involved in the construction, manufacture and use of outcomes of your engineering activities.

Professionalism, Integrity and Competence: Members shall undertake their engineering activities with professionalism and integrity and shall work within their levels of competence. Under this clause you should have due regard to:

- 2.1 Exercising your initiative, skill and judgement to the best of your ability for the benefit of your employer or client.
- 2.2 Giving engineering decisions, recommendations or opinions that are honest, objective and factual. If these are ignored or rejected you should ensure that those affected are made aware of the possible consequences. In particular, where vested with the power to make decisions binding on both parties under a contract between principal and contractor, acting fairly and impartially as between the parties and (after any appropriate consultation with the parties) making such decisions independently of either party in accordance with your own professional judgement.
- 2.3 Accepting personal responsibility for work done by you or under your supervision or direction and taking reasonable steps to ensure that anyone working under your authority is both competent to carry out the assigned tasks and accepts a like personal responsibility.
- 2.4 Ensuring you do not misrepresent your areas or levels of experience or competence.
- 2.5 Taking care not to disclose confidential information relating to your work or knowledge of your employer or client (or former employer or client) without the agreement of those parties.
- 2.6 In providing advice to more than one party, ensuring that there is agreement between the parties on which party is the primary client, and what information may be shared with both parties
- 2.7 Disclosing any financial or other interest that may, or may be seen to, impair your professional judgement.
- 2.8 Ensuring that you do not promise to, give to, or accept from any third party anything of substantial value by way of inducement.
- 2.9 First informing another Member before reviewing their work and refraining from criticising the work of other professionals without due cause.
- 2.10 Upholding the reputation of the Institution and its members, and supporting other members as they seek to comply with the Code of Ethics.
- 2.11 Following a recognised professional practice (Model Conditions of Engagement are available) in communicating with your client on commercial matters.

Commitment to Community Well-being : Members shall recognise the responsibility of the profession to actively contribute to the well-being of society and, when involved in any engineering activity shall, endeavour to identify, inform and consult affected parties. Under this clause you should have due regard to:

- 3.1 Applying your engineering skill, judgement and initiative to contribute positively to the well-being of society.
- 3.2 Endeavouring to identify, inform and consult parties affected, or likely to be affected, by your engineering activities

- 3.3 Recognising in all your engineering activities your obligation to anticipate possible conflicts and endeavouring to resolve them responsibly, and where necessary utilising the experience of the Institution and colleagues for guidance.
- 3.4 Treating people with dignity and having consideration for the values and cultural sensitivities of all groups within the community affected by your work.
- 3.5 Endeavouring to be fully informed about relevant public policies, community needs, and perceptions, which affect your work.
- 3.6 As a citizen, using your engineering knowledge and experience to contribute helpfully to public debate and to community affairs except where constrained by contractual or employment obligations.

Sustainable Management and Care of the Environment: Members shall recognise and respect the need for sustainable management of the planet's resources and endeavour to minimise adverse environmental impacts of their engineering activities for both present and future generations. Under this clause you should have due regard to:

- 4.1 Using resources efficiently.
- 4.2 Endeavouring to minimise the generation of waste and encouraging environmentally sound reuse, recycling and disposal.
- 4.3 Recognising adverse impacts of your engineering activities on the environment and seeking to avoid or mitigate them.
- 4.4 Recognising the long-term imperative of sustainable management throughout your engineering activities. (Sustainable Management is often defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs).

Sustaining Engineering Knowledge: Members shall seek to contribute to the development of their own and the engineering profession's knowledge, skill and expertise for the benefit of society. Under this clause you should have due regard to:

- 5.1 Sharing public domain engineering knowledge with other engineers so that the knowledge may be used for the benefit of society.
- 5.2 Seeking and encouraging excellence in your own and others' practice of engineering.
- 5.3 Contributing to the collective wisdom of the profession.
- 5.4 Improving and updating your understanding of the engineering and encouraging the exchange of knowledge with your professional colleagues.
- 5.5 Wherever possible sharing information about your experiences and in particular about successes and failures.

Part 3 – Minimum Standards of Acceptable Ethical Behaviour by Members

General obligations to society

1. Take reasonable steps to safeguard health and safety

A Member must, in the course of his or her engineering activities, take reasonable steps to safeguard the health and safety of people.

2. Have regard to effects on environment

- (1) A Member must, in the course of his or her engineering activities,—
 - (a) have regard to reasonably foreseeable effects on the environment from those activities; and
 - (b) have regard to the need for sustainable management of the environment.
- (2) In this context, **sustainable management** means management that meets the needs of the present without compromising the ability of future generations (including at least the future generations within the

anticipated lifetime of the end products and by-products of activities) to meet their own reasonably foreseeable needs.

3. Act with honesty, objectivity, and integrity

A Member must act honestly and with objectivity and integrity in the course of his or her engineering activities.

General professional obligations

4. Not misrepresent competence

A Member must—

- a) not misrepresent his or her competence; and
- b) undertake engineering activities only within his or her competence; and
- c) not knowingly permit engineers whose work he or she is responsible for to breach paragraph (a) or paragraph (b).

5. Not misrepresent Membership status

A Member must not (in connection with a business, trade, employment, calling, or profession) make a false or misleading representation, or knowingly permit another person to make a false or misleading representation, that services are supplied by a Member of the Institution.

6. Inform others of consequences of not following advice

- (1) A Member who considers that there is a risk of significant consequences in not accepting his or her professional advice must take reasonable steps to inform persons who do not accept that advice of those significant consequences.
- (2) In this context, significant consequences means consequences that involve
 - (a) significant adverse effects on the health or safety of people; or
 - (b) significant damage to property; or
 - (c) significant damage to the environment.

7. Not promise, give, or accept inducements

A Member must not

- a) promise or give to any person anything of substantial value intended to improperly influence that person's decisions that relate to the Member's activities; or
- b) accept from any person anything of substantial value intended to improperly influence his or her professional engineering decisions.

Obligations to employers and clients

8. Not disclose confidential information

- (1) A Member must not disclose confidential information of an employer or client without the agreement of the employer or client.
- (2) Subclause (1) does not apply if
 - (a) the failure to disclose information would place the health or safety of people at significant and immediate risk; or
 - (b) the Member is required by law to disclose that information.

9. Not misuse confidential information for personal benefit

A Member who obtains another person's confidential information in connection with one purpose in the course of his or her engineering activities must not use that information for another purpose that is to his or her own personal benefit.

10. Disclose conflicts of interest

A Member must disclose to an employer or client any financial or other interest that is likely to affect his or her judgement on any engineering activities he or she is to carry out for that employer or client.

Obligations owed to other engineers

11. Not review other engineers' work without taking reasonable steps to inform them and investigate

- (1) A Member who reviews another engineer's work for the purpose of commenting on that work must take reasonable steps to
 - (a) inform that engineer of the proposed review before starting it; and
 - (b) investigate the matters concerned before commenting.
- (2) Subclause (1) does not apply if taking those steps would result in there being a significant and immediate risk of harm to the health or safety of people, damage to property, or damage to the environment.

This version of the IPENZ Code of Ethics was approved by the Board to take effect from 1 January 2005.

List of Attachments

Attachment 1	Requirements for Initial Academic Education for Professional Engineers
Attachment 2	IPENZ Accreditation policy
Attachment 3	New Zealand Engineering degrees given IPENZ Accreditation at http://www.ipenz.org.nz/ipenz/Education_Career/accreditation/four_year.cfm (Other Washington Accord accredited qualifications, at http://www.washingtonaccord.org/)
Attachment 4	Chartered Professional Engineers of New Zealand Act (2002), on IPENZ website at http://www.ipenz.org.nz/ipenz/forms/pdfs/CPEngAct.pdf
Attachment 5	Chartered Professional Engineers Rules (No 2) 2002 – on IPENZ website at http://www.ipenz.org.nz/ipenz/forms/pdfs/CPEngRules.pdf
Attachment 6	Chartered Professional Engineers Amendment Rules 2004– on IPENZ website at http://www.ipenz.org.nz/ipenz/forms/pdfs/CPEng_Rule_changes_2004.pdf
Attachment 7	PR100 Application Handbook for Professional Engineers– on IPENZ website at http://www.ipenz.org.nz/ipenz/forms/pdfs/PR100_Application_Handbook_Professional_Engineers.pdf
Attachment 8	PR105 Competence Assessment Application Form– on IPENZ website at http://www.ipenz.org.nz/ipenz/forms/pdfs/PR105_Compentence_Assessment_Application_Form.doc
Attachment 9	PR150 Continued Professional Development Activities– on IPENZ website at http://www.ipenz.org.nz/ipenz/forms/pdfs/PR150_Continued_Professional_Development_Activities.doc
Attachment 10	PR170 Referee Declaration & Evaluation Form– on IPENZ website at http://www.ipenz.org.nz/ipenz/forms/pdfs/PR170_Referee_Declaration_&_Evaluation%20Form.doc
Attachment 11	PR180 Summary of Responsibility for Complex Engineering Activities– on IPENZ website at http://www.ipenz.org.nz/ipenz/forms/pdfs/PR180_Summary_of_Responsibility_for_Complex_Engineering_Activities.doc
Attachment 12	PR 401 Assessment Report Form
Attachment 13	PR405 CAB Decision Report Form