ENGINEERS AUSTRALIA

ACCREDITATION BOARD

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FOR

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(COMPETENCY BASED)

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1. INTRODUCTION

Engineers Australia as the national competency authority responsible for the accreditation of engineering education programs for professional practice in Australia provides a range of documents within its Accreditation Management System. These documents provide a resource for both engineering educators/trainers and for those responsible for the accreditation function. An index of the documents comprising the Accreditation Management System is provided in:

'***Engineers Australia – Accreditation Management System – Document Listing***' - for competency based programs in the occupational category of Engineering Associate.

This guideline document must be read in conjunction with the Accreditation Criteria Summary (Reference 1), Engineers Australia Policy on Accreditation of Professional Engineering Programs (Reference 2) and most importantly in conjunction with the Accreditation Criteria Guidelines (Reference 3).

The key criteria underpinning the accreditation process for learning and assessment programs in the Vocational Education and Training VET sector are summarised in the discussion to follow. The accreditation criteria provide the basis for evaluation of engineering VET programs and also provide engineering educators with a resource for the review and development of the teaching and learning environment, the learning and assessment design and review tasks, and for the processes of continuous quality improvement.

This accreditation guide is for Registered Training Organisations (RTOs) seeking Engineers Australia accreditation of a program at Australian Qualifications Framework (AQF) level 6 (Reference 6) and in the occupational category of Engineering Associate.

This guide only applies to a learning and assessment program that has been implemented in accordance with either:

1. a nationally endorsed Training Package, or
2. a state or territory accredited course, which is competency based.

Engineers Australia accreditation of any implementation of an nationally endorsed Training Package or state or territory accredited course will only be considered if compliance is demonstrated with the requirements of the Australian Quality Training Framework (AQTF) 2007 Essential Standards for Registration (Reference 7).

Before full Engineers Australia accreditation can be accorded, a verified internal or external audit must have been undertaken against the criteria in the AQTF 2007 Essential Standards for Registration and the AQTF 2007 User's Guide to Essential Standards for Registration (Reference 8). The report of such an audit must be made available to Engineers Australia as part of the RTO's accreditation submission.

In preparing the submission, RTOs are encouraged to make reference to the following AQTF documents:

- AQTF 2007 Essential Standards for Registration – (Reference 7),
- AQTF 2007 User's Guide to the Essential Standards for Registration – (Reference 8),
- AQTF 2007 Excellence Criteria for Registered Training Organisations –

DRAFT – December 2007 (Reference 9), and

- AQTF 2007 Guide for Registered Training Organisations Excellence Criteria – DRAFT – (Reference 10).

The following points are a guide to the development of the submission documentation and are supplementary to the training package documents that underpin the program submitted for Engineers Australia accreditation.

In this document each element of the performance criteria is discussed in turn, to develop a more complete understanding of the overall performance expectations and compliance requirements within the Engineers Australia's Accreditation Management System.

The accreditation criteria are catalogued under the following section headings and the subsequent discussion is in accordance with that structure:

- Operating Environment,
- The Learning and Assessment Program,
- Quality Systems.

2. INTERPRETATION OF REQUIREMENTS

In this discussion of the criteria an attempt has been made to distinguish absolute requirements for accreditation from expected characteristics and performance levels and advice. Again the emphasis is on encouraging innovation and diversity in the learning and assessment design, delivery assessment, review and quality processes. Statements variously employ the words **must** and **should**. Statements containing **must** denote absolute requirements for the program to be accredited. Statements containing **should** are not individually binding but for accreditation to be granted, it is expected that the program will meet a high proportion of them.

3. GUIDELINES TO THE CRITERIA

3.1. The Operating Environment

3.1.1. Organisational Structure and Commitment to Engineering Education

There must be an identifiable organisational entity responsible for engineering learning within the RTO which is responsible for awarding the qualification. The substantive organisational entity must have clearly designated and devolved accountability for the leadership, management and delivery of engineering education programs.

In this document and other documents comprising the Accreditation Management System, the term engineering school has been used as the universal term for the substantial organisational entity accountable for engineering learning.

It should be noted that other organisational structures may be acceptable but it is unlikely, for example, that an engineering program would be accredited if it were taught and managed in isolation by a handful of staff, primarily qualified and practising in a non-engineering discipline.

It would normally be expected that the engineering school would have leadership responsibility – subject to the approval processes of the RTO – for the learning and assessment design; delivery, assessment, support and management of the engi-

neering VET programs, for the management of associated resources, and for the appointment and professional development of staff. If this is not the case, the RTO will need to demonstrate how sufficient engineering expertise is brought to bear on decisions in these areas.

The delegated accountability within the engineering school for the management and delivery of each engineering learning and assessment program should be clearly specified.

There must be evidence that the RTO has a long term commitment to engineering learning which is regarded as a significant component of its core activities, and has adequate arrangements in place for planning, development, delivery, and continuous quality improvement of engineering programs, and for supporting the associated professional development of staff engaged in the delivery and assessment of engineering programs. This would most commonly be evident from an RTO's mission statement and strategic plans, from the approved mission statement and strategic plans of the engineering school, perhaps from corporate responses to engineering school planning submissions or initiatives, and from the outcomes of formal reviews and performance evaluations.

The RTO must have in place formally constituted governance structures for the ongoing review and continuous quality improvement of existing programs and for formal approval of new programs and for program amendments.

The formally constituted governance structures should be supported by policies, procedures and processes for new program approval, development, implementation, registration, review and audit compliance which demonstrates the RTO's commitment to continuous quality improvement.

3.1.2. Teaching and Support Staff Profile

There must be an adequate number of teaching staff with the capability to assure the delivery and assessment of the designated units of competency and the quality of the engineering program. As a guide, a viable engineering school would be expected to have not less than three full-time-equivalent staff with specialist engineering knowledge and experience in each designated field in which an engineering associate qualification is offered.

In no case should a major program be dependent on a single individual.

There should be an acceptable balance of staff appointments in order to provide appropriate teaching leadership and at the same time providing appropriate experience, teaching expertise and learner support appropriate to the program.

It is considered important that the staff should come from diverse backgrounds, embodying an appropriate depth and mix of teaching qualifications, experience and engineering-practice experience in non-teaching environments preferably with a strong profile of industrial experience. The school's teaching and/or professional activities should include pro-active and vigorous interaction with industry and the broader community.

In determining the capabilities of staff the Accreditation Board will look at qualifications (both in engineering and in education), engineering practice activities, teaching experience, and contributions to the advancement of engineering knowledge, practice and learning. Membership of professional bodies, chartered status

and effective participation in on-going professional development activities are also considered as relevant indicators.

There should be an appropriate staff policy in place to address workload management issues. The Board will look for evidence that staff numbers and teaching loads are such as to permit adequate interaction with learners and support for the range of learning experiences offered, with adequate opportunity available to staff for professional engagement outside of teaching. Arrangements for workload management, capacity and succession planning should support these objectives.

The engineering school and/or the RTO should have sufficient staff and facilities to provide adequate levels of learner counselling, support services, and interaction with relevant key stakeholders such as employers and graduates of the program.

There should be an RTO policy in place which addresses the issue of appropriate gender balance of the teaching staff within the engineering school.

Similarly there should be an appropriate RTO policy in place for staff development. Staff development programs should aim at developing pedagogical capabilities in teaching, learning and assessment design, the use of new delivery and assessment methodologies and in the development of learning quality management systems.

In addition staff development programs should also aim at developing capabilities such as consulting, industry engagement and services to professional bodies and the broader community as well as undertaking short courses and/or formal education programs in a designated field of learning/practice.

Teaching and support staff should be aware of the need to address gender, cross-cultural, inclusiveness and equity issues. Staff development programs should reflect these important criteria. There must be an adequate arrangement for the supervision and guidance of both regular and sessional staff members.

As well as the full-time teaching staff team, engineering schools are strongly encouraged to utilise the expertise of practising professionals/paraprofessionals in engineering and related fields for guest lecturing or sessional delivery. The strategic use of sessional and/or industry expert presenters is strongly encouraged to enrich the overall staff skills profile and enhance the learner learning experience.

In addition, there must also be sufficient qualified and experienced technical and administrative staff members to support the delivery of the learning and assessment program.

It is recognised that programs will be staffed and delivered in a variety of modes. RTO based learners may undertake learning activities at locations other than the ‘host’ campus through for example, work placement programs and/or workplace learning. RTOs may form partnerships with both traditional and non-traditional providers to facilitate the learning. The RTO awarding the qualification will be responsible for assuring the capabilities of all staff involved, and the Board will require evidence of how this is achieved.

3.1.3. Teaching Leadership and the Learning Culture

For each program there should be a clearly identified and effective leader of a cohesive teaching team. Terms of reference, accountabilities and reporting

obligations for the program teaching team and leader should be clearly defined and understood by all stakeholders.

The Board will look for evidence of a dynamic, innovative and progressive learning environment in the engineering school based on a sound pedagogical framework and the adoption of best practice. In particular there should be awareness amongst teaching staff of current and emerging developments in VET. There must be a pro-active attitude to the adoption of continuous quality improvement and best practice.

There should be significant ongoing involvement of teaching and support staff in the processes of detailed learning and assessment design, review and continuous quality improvement. A holistic approach requires for a particular program the full involvement of all teaching staff working as a team and this should be evident to learners.

The program teaching team, inclusive of support staff, would be expected to meet regularly to consider input and feedback from the full range of key stakeholders and use this input for the continuous improvement of the delivery and assessment of the designated units of competency. The teaching team must regularly review each learner's assessments to monitor the attainment of the designated units of competency for the program as a whole.

Through policy and operating practices there should be a clear acknowledgment of the need for cooperative industry and community outreach programs incorporating teaching and work placement linked to the learning and assessment program. This will enrich the experiences of learners thereby enabling them to reach their full potential. This approach will also help to facilitate the on-going professional development of staff.

Staff should actively role-model the Engineers Australia Stage 1 Competency Standard for Engineering Associate and should be continually aware of their responsibility to do so.

Staff appointments, staff development, management and codes of practice in the school and the RTO should address gender, cultural, social differences and equity issues encouraging diversity and reflecting an inclusive operating environment which will enable the development of the learner to their full potential.

3.1.4. Facilities and Physical Resources

All learners must be provided with access to appropriate computing and IT systems and associated support staff to underpin the program teaching needs as well as facilitating the continuous improvement of the program and the RTO's systems and processes.

In addition all learners must be provided with access to a supportive learning environment which includes modern teaching resources, practical learning, project and laboratory facilities, adequate classrooms, study areas, library and information resources. General infrastructure should facilitate the development, delivery and assessment of the designated of units of competency, for each program, matched to the needs of individual learners.

Furthermore learners must be provided with access to modern technical equipment and management tools as well as test and measurement equipment appropriate to current and emerging industry practice.

For all programs, there should be adequate facilities to support learner-staff interaction.

For programs involving delivery of units of competency, or elemental learning contributions remote from the host campus, there must be communication facilities sufficient to provide learners with learning experiences and support which is equivalent to that provided at the RTO's host campus.

3.1.5. Funding

The RTO must have in place adequate policies and mechanisms for funding its engineering school and facilitating the generation of funds from external sources. Similarly there must be established policies and appropriate practices for attracting, appointing, retaining and rewarding well-qualified staff and providing for their ongoing professional development as well as for providing and updating infrastructure and support services.

The funds provided by the RTO from all sources including government recurrent funds, capital grants, fee income, and other income earned through consulting and entrepreneurial activity, should be based on sound business planning principles.

Furthermore the funding should be based on the use of an appropriate budgeting and funding formula which provides for the distribution to and within the engineering school.

The RTO's strategic planning cycle, budgeting and funding formula and distribution models must ensure appropriate levels of support for current and future needs and for the on-going viability of the engineering school's programs.

3.1.6. Strategic Management of the Learner Profile

Resources provided to the engineering school are usually dependent on viable learner numbers. A criterion for viability is therefore a continuing level of demand from potential learners in sufficient numbers to maintain the program. On-going program viability should be monitored through rigorous demand analysis and enrolment trends. Strategic decisions on program offerings should be taken systematically in consultation with key stakeholders and on an appropriate and regular time scale.

The engineering school should be able to demonstrate a reasonable relationship between the learner entry profile, retention, progression and completion rates.

Enrolment to the program must be based on the RTO's policy for entry requirements and this should include an assessment of each individual learners profile, experience and capability. Appropriate enrolment criteria may include:

a) satisfactory completion of a year 12 secondary school program, or
b) assessment only or recognition of prior learning, or
c) any combination of (a) and (b).

The RTO should provide learners with adequate learner counselling and advisory support services.

Where credit is offered via recognition of prior learning, this must be clearly defined and rigorous processes for the analysis, assessment and verification of the prior learning must be evident. These processes should be consistent with the AQF RPL National Principles.

3.2. The Learning and Assessment Program

3.2.1. Specification of the Learning and Assessment Program Outcomes

The Engineers Australia National Generic Competency Standards – Stage 1 Competency Standard for Engineering Associate (Reference 5) provides a detailed generic description of the expected knowledge, capabilities and attributes expected of the graduate Engineering Associate.

The Stage 1 Competency Standard develops detailed elements of competency and an indication of performance expected under the key headings of Knowledge Base, Engineering Ability and Professional Attributes.

The learning and assessment program must clearly reflect the field of engineering practice and the area(s) of application and be commensurate with AQF level 6.

The rationale for the implementation of the program should be based on a comprehensive analysis of the needs of appropriate stakeholders including industry, government, learners and community and trends in engineering practice, as well as the use of VET benchmark indicators and feedback from key stakeholders.

The program implementation should provide learners and the key stakeholders with an explicit and comprehensive summary of the vocational outcomes which learners will acquire on the completion of the specific program.

The selection and packaging of the designated units of competency for the specific program must be based on the requirements of the nationally endorsed training package or state/territory accredited course and in consultation with the RTO's program advisory body, learners and other appropriate external stakeholders.

The attainment of the designated units of competency for the specific program should enable the learner to demonstrate a balanced and integrated development of underpinning knowledge and skills, technical competence and engineering application skills, as well as personal and professional capabilities which are consistent with the Stage 1 Competency Standard for Engineering Associate.

Appropriate breadth and depth of competence should be clearly demonstrated in the technical domains comprising the field of practice and through the development of well defined knowledge and skills.

3.2.2. Title of Program and Award

To be eligible for accreditation, an engineering VET program must include the word(s) *engineering and/or technology* in its title and, unless the circumstances are exceptional, must lead to a qualification which includes *engineering and/or technology* in its title.

The title of the program which appears on the award must be consistent with learning at the level of the Advanced Diploma (AQF6) prescribed in the AQF Handbook for the category of Engineering Associate.

A program in the engineering associate category must aim to deliver graduates with capabilities appropriate to a designated field of engineering practice. This will most commonly be reflected in the title of the program and/or the qualification.

The key requirement is that the program engages learners with an identifiable and coherent area of engineering application, providing an appreciation of current and emerging technical issues and the development of competence in handling well defined technical/operational problems.

Where a title denotes specialisation in a particular field of practice, the program must impart well defined technical/operational skills and knowledge in that specialisation. A program that omits coverage of substantial topics in the technical field implied by the title, in which a paraprofessional in that field could reasonably be expected to have competence, should not be accredited.

Some of the fields of practice and specialisations already recognised in the titles of accredited engineering associate programs are listed in Reference 4.

3.2.3. Program Structure and Implementation Framework

The requirement of an accredited engineering associate program in Australia is two or more years of full-time-equivalent learning at AQF level 6, with entry to the program based on the requirements detailed in 3.1.6 above.

The typical teaching year involves two semesters of eighteen weeks each of formal learning and assessment which should enable learners to become self directed and suit their individual learning styles and capabilities.

The learning and assessment program must comprise an integrated set of tasks and structured learning and assessment experiences leading to the attainment of designated units of competency.

The program structure must be appropriate to facilitate the development of well defined technical competence in the designated field of practice and in nominated specialist areas.

Reflecting the requirements of the Accreditation Policy for Professional Engineer programs, a competency based program at AQF level 6 for the occupational category of Engineering Associate, would be expected to include the following major elements with the percentages denoting indicative proportions of the total learning experience measured in terms of learner effort.

1. Underpinning knowledge of mathematics, physical sciences, information systems and engineering fundamentals appropriate to the discipline of learning. (30%)
2. Application of the above to the solution of well defined problems and to the practice of engineering and technology including: the use of standards and codes of practice; specification and installation of systems; standard design procedures; assessment of technical and policy options; observation, analysis, testing, operations and maintenance functions and the assessment of risk across a broad operational context. (35%)
3. Technical specialisation within the engineering discipline. (10%)
4. Professional and personal skills development including: effective oral and written communication skills; the ability to operate as an individual and/or leader in a team based environment; the use and management of information systems and an understanding of the business environment. (15%)
5. Application of the principles, responsibilities and ethics of engineering practice as well as an awareness of and commitment to the professional obligations associated with health,, safety and environmental sustainability. (10%)

The suggested percentage of coverage for each of the above categories is indicative only.

Documentation of the learning and assessment design should clearly demonstrate:

- individual learning experiences systematically aggregating to deliver each of the designated units of competency;
- associated assessment methodologies aligned to collectively validate the attainment of each unit of competency;
- any clustering of suitable units of competency where this can facilitate problem and/or project based learning;
- delivery and assessment strategies adapted to suit individual learning styles and which may include the following:
  - experiences in the work place,
  - any use of simulations, which can clearly demonstrate the provision of valid engineering outcomes;
- an approach to the design of the learning and assessment program should be holistic and acknowledge the global nature of engineering practice.

The program structure must accommodate the requirements specified in section 3.2.4 below and should facilitate an integrated approach to:

- developing underpinning knowledge and skills;
- developing well defined knowledge and understanding within a nominated field of engineering practice;
- providing practical and laboratory learning, problem solving, design and project based learning;
- developing personal and professional capabilities;
- exposing learners to engineering practice.

3.2.4. Alignment with Engineers Australia Stage 1 Competency Standard

The competency based learning and assessment system and review process must ultimately demonstrate the attainment of underpinning knowledge and skills, technical capabilities, engineering application skills, personal attributes, values and professional attitudes which are specified in Engineers Australia Stage 1 Competency Standard for Engineering Associate.

An integrated and pervasive approach to learning and assessment design must focus on delivery of the designated units of competency selected from the appropriate national training package or state/territory accredited course. The designated units of competency will be delivered through a wide range of learning and assessment activities spread throughout all stages of the program. Alignment with the Engineers Australia Stage 1 Competency Standard for Engineering Associate must be demonstrated through a formal mapping process.

The Engineers Australia National Generic Competency Standards - Stage 1 – Competency Standard for Engineering Associate summarises the necessary outcomes, together with supporting elements, associated performance and range indicators in three categories as follows;

- **Knowledge Base which includes the following**.
  - Knowledge of science and engineering fundamentals.
  - Knowledge and understanding of engineering and technology.
  - Knowledge and application of engineering techniques and resources.
  - General knowledge supporting the nominated field(s) of engineering practice.

- **Engineering Ability which includes the following**.
  - Application of standards and codes of practice.
  - Specifying and installing systems.
  - Understanding of design procedures.
  - Assessing technical and policy options.
  - Observation, analysis and testing.
  - Specific training for:
    - candidates whose background has included advanced equipment specific training, or
    - candidates from a mainly educational background.
  - Responsibility as a technical expert.
  - Understanding of the business environment

- **Professional Attributes which include the following**.
  - Ability to communicate effectively with the engineering team and with the broader community.
  - Ability to manage information and documentation.
  - Capacity for creativity and innovation.
  - Understanding and commitment to professional and ethical responsibilities.
  - Ability to operate effectively as an individual or as a member of a multidisciplinary and multicultural team.
  - Ability to operate effectively as a team leader or as a manager in a diverse team based environment.
  - Capacity for and commitment to life long learning and continuing professional development.
  - Demonstration of professional attitudes.

3.2.5. Exposure to Engineering Practice

Exposure to engineering practice is a fundamental element of the learning and assessment program for an Engineering Associate. Although the status of Chartered Engineering Associate requires a substantial period of experiential formation in industry after graduation, it is clearly unsatisfactory for the learner's perceptions of engineering to develop, over the first two critical years, in complete isolation from the realities of industry practice.

Given the competency based approach to learning, it is essential to ensure that exposure to industry practice is embedded as a key element of the learning and assessment program.

There should be a documented system in place for setting, reviewing and monitoring the delivery and assessment of the specified learning contributions arising from exposure to engineering practice.

Engineering practice exposure must make a significant and deliberate contribution to the attainment of the designated units of competency for the specific program.

The elements associated with each major episode of exposure should clearly be understood by all stakeholders within each of the appropriate designated unit of competency. There should be defined contributions from these learning activities to the specific elements within the units of competency and to the completion of the program as a whole.

There should a method provided for learners to track and monitor the outcomes of their engineering practice exposure. This may for example be through a professional reflective journal or portfolio system where learners record and reflect on their experiences against the designated units of competency set for the program.

Engineering practice exposure must include some of the following:

- work place simulation;
- industry based projects and problem solving;
- use of expert guest presenters and sessional lecturers;
- teaching and practical instruction from industry based practitioners;
- formal industry visits;
- formal work placements;
- use of staff with industry experience;
- practical experience in an engineering environment outside the RTO;
- mandatory exposure to lectures on professional ethics and conduct,
- study of industry policies, processes, practices and benchmarks;
- interviews of engineering practitioners;
- direct industry input of data and advice to problem solving, projects and evaluation tasks;
- electronic links with practising engineering professionals/paraprofessionals; and
- industry based case studies.

It is recognised that there is no substitute for practical experience in the context of a real engineering environment external to the RTO environment. Therefore Engineers Australia strongly advocates that all engineering schools include a minimum of 6-weeks of such experience (or an agreed satisfactory alternative) as an integral part of the learning design and in addition to the other elements suggested, and make strenuous effort to assist all learners to gain placements of suitable quality. However it is recognised that this may not always be possible.

The requirement for accreditation is that programs incorporate a mix of the above elements of industry practice exposure – perhaps offering a variety of opportunities to different learners.

3.3. Quality Systems

Appropriate policy, processes and practices must be in place at all levels within the RTO to assure the quality of engineering learning. The dimensions of the learning quality system must embrace the following components.

3.3.1. Formal Processes for New Program Approval, Registration, Development and Amendment

The RTO must have in place formal processes for new program approval, registration, development and amendment of a new program.

The formal processes should incorporate key stakeholder input, demand analysis which establishes the rationale for the specific program, an outcomes specification including a summary of the designated units of competency, learning and assessment program design and development aligned to the nominated field of engineering practice.

3.3.2. External Stakeholder Input to Continuous Improvement Processes.

Valid preparation of learners for engineering practice requires proactive and productive interaction with key external stakeholders and especially industry on a continuing basis. There have been many messages from industry, often at the highest levels, indicating that educational institutions have insufficient appreciation of the real needs of employment and must learn the real-world lessons of being customer driven, the importance of continuous quality improvement and the need for continuous interaction with a broad range of external stakeholders.

Furthermore if Australia is to have a globally competitive economy, then it must have a globally competitive education and training system which is responsive to the needs of its key stakeholders. Accordingly, all education providers must work collaboratively with industry as is a key stakeholder in the process. For the response to be meaningful and effective, industry must make a serious commitment to the partnership in return.

A specific requirement of the Engineers Australia Accreditation Policy is a formally-constituted advisory mechanism or mechanisms, involving program oriented external stakeholders generally and industry in particular. The formally-constituted advisory mechanism or mechanisms referred to as the program industry advisory body, would be expected to include a governance structure, terms of reference, a summary of member roles and responsibilities, induction training and a schedule for the frequency of the meetings of the above body.

Through the program industry advisory body, the engineering school must seek to secure the active participation of practising professional engineers/engineering technologists/engineering associates, graduates, professional bodies and representatives of leading employers of engineering graduates in the specification, development, review and ongoing improvement of learning and assessment.

External stakeholders should fufil an influential role in the processes of selection, review, and attainment monitoring of the designated units of competency for the specific program.

Local industry input at the individual program level of course will complement other levels of industry advice received at the national training package level through the relevant Industry Skills Council and at the state level through Industry Training Advisory Boards or equivalent advisory bodies.

In addition, the involvement of industry stakeholders at the program level may well facilitate learner access to structured work placements and exposure to current and emerging engineering practice. Effective and productive industry linkages are crucial also of course for opening collaborative project opportunities and also for the professional development of staff.

3.3.3. Learner Input to Continuous Improvement Processes

There must be formal processes for securing specific and systematic feedback from learners. There should be evidence of the systematic application of feedback in conjunction with other quantitative measures for the setting, monitoring and re-

view of the delivery of the designated unit of competency for the specific program.

Direct involvement of learners in the processes of continuous quality improvement is strongly encouraged. This can be achieved by the use of staff-learner consultation forums, focus groups, use of survey instruments and commissioned submissions which should be integrated to facilitate productive involvement as well as providing direct learning experiences for the learner in the processes of continuous quality improvement.

Learners should be seen as partners in a culture of continuous quality improvement.

3.3.4. Approach to Learning Design and Review

A systematic and holistic 'big picture' approach by the engineering school to learning design, delivery, assessment, review and continuous quality improvement should be evident. This should begin with the application of formal processes for the selection and packaging of the designated units of competency for the specific program, and with vocational outcomes aligned with the field of engineering practice. Selection of the designated units of competency should also be guided by the need to satisfy the Engineers Australia Stage 1 Competency Standard for Engineering Associate.

A structured, approach to learning and assessment design should explicitly demonstrate how the designated units of competency can be attained by learners.

At the unit of competency level, the learning and assessment design process should track the appropriate learning activities and the use of formative and summative assessment methodologies that aggregate to validate the attainment of competency.

In substantiating delivery of the designated units of competency it is important to demonstrate the relationship between the elements, performance criteria, underpinning knowledge and skills, application of the range of variables, use of evidence guides, application of assessment methods and ongoing feedback.

A systematic mapping of the learning and assessment activities detailed above against each of the designated units of competency should be a prime outcome of this process underpinning the competency based approach to learning and assessment design. These mapping processes should ideally extend to 'close the loop' on delivery of the Engineers Australia Stage 1 Competency Standard for Engineering Associate.

The overall goal of the learning design process is to ensure that the learner experiences adequate development of the knowledge base, engineering ability and professional attributes detailed in 3.2.4 above.

The learning and assessment design process should utilise experimental, problem and project based learning methodologies to support structured, discovery and investigatory learning within the specified field of practice.

The learning and assessment design, delivery, assessment, review and continuous quality improvement processes should be inclusive of all program teaching and support staff through regular documented meetings and discussions and involve on-going input and feedback from learners. The use of documented improvement actions and processes arising from these interactions should be used to drive the

continuous quality improvement process.

The learning and assessment design process should incorporate the use of bench marked practices and data gathering referred to in item 3.3.7 below as well as monitor feedback from key stakeholders including industry needs and learner demand.

3.3.5. Approach to Assessment Design and Performance Evaluation

The approach to assessment design should be holistic, systematic, integrated and aligned with the learning design detailed in 3.3.4 above.

The assessment tools and methodologies which may include diagnostic, formative and summative methods used for the overall program must be rigorously aligned with each of the designated units of competency.

At the program level, assessment design should provide for flexible assessment approaches which may include choosing one or more of the following pathways:

1. learning and assessment;
2. assessment only or recognition of prior learning;
3. any combination of (1) and (2) above.

Assessment by any pathway, leading to nationally recognised AQF qualifications and statements of attainment in the VET sector must meet the requirements of the Assessment Guidelines of the learning and assessment program and the AQTF.

Adequate range and depth of direct, indirect and supplementary evidence should be gathered, in compliance with the assessment guidelines for the learning and assessment program.

Evidence gathered by the assessor may include a combination of the following methods and techniques such as practical demonstrations or simulations, third party reports, questioning and interviews, personal statements or resumes, workplace documents, training records, case studies, projects, journal or diary, testimonials and awards, portfolio of evidence.

In developing the text in 3.3.5 above, reference has been made to the Training Package Development Handbook Guidelines – Mandatory Text for the Training Package Assessment Guidelines Section (Reference 11).

Similarly the performance evaluation processes used for the overall program must be rigorously aligned with each of the designated units of competency.

Sources of performance evaluation data at both the unit of competency level, and for the program as a whole, will include surveys, focus and discussion groups as well as questionnaires and professional interviews with key stakeholder groups and the broader community. Collectively this broad range of measures will provide the inputs for performance evaluation and monitoring of the delivery and assessment of the designated units of competency for the specific program.

Substantiating delivery and assessment of the designated units of competency in this way will, through mapping, also validate the satisfactory attainment of the Stage 1 Competency Standard for Engineering Associate as summarised in 3.2.4 above. .

Systemic validation and moderation processes should be in place to monitor and

manage the assessment processes for the designated units of competency.

3.3.6. Dissemination of Learning and Assessment Program Philosophy

The learning and assessment design process should be properly documented and made available in an appropriate form to each of the various stakeholders involved in the process.

For learners enrolled in a specific program, this would mean the supply of guideline documents including the title and the national qualification code number for the program, a statement of purpose, a statement of the completion requirements, a summary of the designated units of competency, the assessment guidelines and a learning and assessment plan.

The learning and assessment plan should demonstrate, via a mapping process, how the development of the designated units of competency occurs through the aggregation of individual learning experiences distributed across the program of study. The learning and assessment plan should also clearly show, for each unit of competence, the linkages between the elements, performance criteria, learning activities and assessment processes.

This holistic view of the learning and assessment design would normally be disseminated via the RTO's web site and/or hard copy program learning guides.

Systematic documentation of the learning and assessment design is crucial to map and manage flexible pathways that might alternatively provide for attainment of competencies.

3.3.7. Formal Processes for Review and Revision on an Existing Program

Formal processes for periodic review and improvement of an existing program should apply and should be consistent with the requirements defined in 3.2.1 to 3.2.5 above.

Any system changes and or revisions issued by the appropriate Industry Skills Council or state/territory accrediting bodies should be recorded and implemented.

As part of the continuous quality improvement process, RTOs are encouraged to use benchmark practices and seek reverification of industry needs and learner demand to ensure the continued currency and relevance of the program.

As part of the program review and revision process, the RTO must be able to demonstrate that the revised program continues to be aligned with the Stage 1 Competency Standard for Engineering Associate.

As part of the continuous quality improvement process, the RTO should demonstrate that a systematic formal and regular program review process has been implemented that engages teaching and support staff, learners and with ongoing input from key external stakeholders.

3.3.8. Benchmarking

Engineering schools should, as part of the development of a culture of continuous quality improvement, engage in on-going comparative bench marking to ensure that the attainment of the designated units of competency for a specific program are comparable with national practice, and where possible international practice.

Comparative analysis could include reference to the appropriate AQTF 2007, AVETMISS, DEEWR and NCVER statistics, reference to information or data from the appropriate Industry Skills Council, exchanges of learning and assessment materials with other RTOs, discussion forums with key external stakeholders, visitation teams and/or the use of external experts and assessors.

As part of the RTO's quest for continuous quality improvement, more systematic benchmarking will occur as part of the on-going process of compliance with the *AQTF 2007 Essential Standards for Registration,* rather than simply satisfying accreditation guidelines. These processes will help in identifying best practices and specific directions for further improvement.

3.3.9. Learner Administration and Support

The RTO must have a robust learner records management system in place which enables auditing of the RTO's systems and processes at any time and provide confirmation of integrity.

There should be formal policies and processes for tracking and monitoring individual learner retention and progression, issuing of advice and the provision of timely warnings to learners at risk, systematic remediation, learner complaint resolution, exclusion and appeal.

The RTO should provide learner advisory processes including appropriate facilities and systems for learner support.

The RTO must have an enrolment system that ensures an acceptable standard of entry for learners from diverse learning backgrounds.

There must be policies and processes for assessing the capability and suitability of prospective learners to enrol in the program.

The RTO enrolment system must publicise the requirements for entry and ensure that only candidates with the appropriate entry requirements are enrolled in the program as detailed in 3.1.6 above.

3.3.10. Compliance with AQTF 2007 - Essential Standards for Registration

To support the submission, the RTO must substantiate full compliance against the AQTF 2007 Essential Standards for Registration.

In particular the RTO must provide either of the following information;

a) a verified copy of the most recent external audit of compliance against the AQTF 2007 Essential Standards for Registration, or
b) if a recent external AQTF 2007 audit report is not available, then AQTF 2007 compliance must be demonstrated by providing a copy of an internal audit which has been verified by the RTO's appropriate Quality Manager or their equivalent.

In addition to the above, the RTO should provide a verified copy of the following: (NOTE: this may also partially satisfy some of the specific documentation requirements requested above in (a) and (b)).

- documented Training and Assessment Strategies (including evidence of industry input), as required for evidence in Standards 1.1, 1.2 and 1.3 of the AQTF 2007 User's Guide to the Essential Standards for Registration; and
- documented actions taken to improve the quality and consistency of assessment systems, processes, tools and practices as required for evidence in Standard 1.5 of the AQTF 2007 User's Guide to the Essential Standards for Registration.

3.3.11. Adoption and conformance with AQTF 2007 - Excellence Criteria (Optional)

To further enhance the submission and to foster a culture of continuous quality improvement, the RTO is encouraged to adopt the *AQTF 2007 Excellence Criteria (Draft)* and provide a verified copy of the most recent internal audit against the requirements of the above criteria.

The internal audit report should be verified by the RTO's appropriate Quality Manager or their equivalent.

4. REFERENCES

1	S02EA_ Comp	Accreditation Criteria Summary.
2	P02EA_ Comp	Engineers Australia Policy on Accreditation of Professional Engineering Programs.
3	G06EA_ Comp	Preparation of Submission Documentation.
4	G07EA_ Comp	Fields of Specialisation.
5	P05EA	Engineers Australia National Generic Competency Standard - Stage 1 Competency Standard for Engineering Associate.
6		AQF Handbook Fourth edition 2007 http://www.aqf.edu.au/
7		AQTF 2007 Essential Standards for Registration http://www.training.com.au/documents/aqtf2k7_ess-std-reg_final2.pdf
8		AQTF 2007 User's Guide to the Essential Standards for Registration http://www.training.com.au/documents/aqtf2k7_usr-guide-ess-std_final2.pdf
9		AQTF 2007 Excellence Criteria for Registered Training Organisations – DRAFT – http://www.training.com.au/documents/aqtf2k7Excellence_Criteria_RTO.pdf
10		AQTF 2007 Guide for Registered Training Organisations Excellence Criteria – DRAFT – http://www.training.com.au/documents/aqtf2k7Excellence_Criteria_Guide.pdf

11		Training Package Development Handbook Guidelines – Mandatory Text for the Training Package Assessment Guidelines Section – NTIS2Template_Assess_Guidelines_Sep07 – VER1.0 http://www.deewr.gov.au/Skills/Overview/Policy/TPDH/Assessmentguidelines/Pages/Home.aspx