ENGINEERS
AUSTRALIA

ACCREDITATION MANAGEMENT SYSTEM

Accreditation Criteria User Guide – VET

AMS-MAN-20

Version 1.0

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Accreditation Criteria User Guide – VET

1. Introduction

1.1 Purpose

The purpose of this document is to provide an interpretation of the accreditation criteria for use in conjunction with the Procedures Manual for VET competency programs.

1.2 Scope

This document addresses programs that deliver the graduate attributes for professionals in the category of Engineering Associate through competency-based programs typical of the Australian Vocational Education and Training (VET) sector.

The accreditation standards for programs delivered in a curriculum-based framework typical of Higher Education programs are *not* within the scope of this document.

1.3 Document Classification

This document (AMS-MAN-20) is classified as a Manual (instructional) and is therefore mandated for consideration by Education Providers when demonstrating compliance with the accreditation criteria set out in the Accreditation Standard (AMS-STD-20). In an outcomes-based accreditation process, however, alternate means of demonstrating compliance can be provided, so that the text under each accreditation criterion, while instructional, constitutes guidance only.

This document (AMS-MAN-20) is intended for use in close conjunction with the associated Procedures Manual – VET (AMS-MAN-21).

1.4 Definitions and Acronyms

1.4.1 Definitions

Accreditation criteria

> The set of factors that are considered by an Evaluation Panel when evaluating the quality of a VET competency-based program (Reference [7]). The accreditation criteria incorporate the Engineers Australia Stage 1 Competency Standard, that is, statements of assessable attributes to be displayed by graduates that indicate that the purpose of the program has been achieved. References [3], [4], [5] provide the Standards for the occupations of Professional Engineer, Engineering Technologist and Engineering Associate, respectively.

Learner

A person being trained and/or assessed by an RTO for the purpose of issuing AQF certification documentation

Engineers Australia Stage 1 Competency Standards

Graduate outcomes expressed as a standard and in the form of generic competencies required of a graduate of a curriculum-based engineering education program or VET competency-based engineering program and specified for entry to practice in the appropriate occupational category of Professional Engineer, Engineering Technologist or Engineering Associate

Competency

The consistent application of knowledge and skill to the standard of performance required in the workplace. It embodies the ability to transfer and apply skills and knowledge to new situations and environments

Competency Program

A program of competency development, delivered within the Australian VET sector and based on either a national training package qualification endorsed by the Australian Industry and Skills Committee (AISC) in accordance with the Standards for Training Packages, or alternatively, a national or state VET accredited course accredited by either ASQA, the Victorian or the Western Australia VET regulators in accordance with the Standards for VET Accredited Courses. For the purposes of this user guide, the terms "qualification" and "course" referred to above have been replaced with the common term "program".

Engineering School

The organisational entity within the RTO with the responsibility for the selection, packaging, implementation and delivery as well as the learning and assessment design of the VET competency programs in engineering

Unit of Competency

The specification of the standards of performance required in the workplace, as defined in a nationally endorsed training package qualification or a VET accredited course

Core Unit of Competency

A unit of competency defined in a national training package qualification or VET accredited course, and which an industry sector has deemed to be an essential outcome if a learner is to be accepted as competent at a particular AQF level. All units may be core, but in many cases competency at a particular level will involve core units plus optional, elective or specialisation-specific units of competency. Core competencies are normally common to the work of an industry sector or occupation category

Element of Competency

Any of the basic building blocks of a unit of competency that describes the key activities that must be performed to demonstrate competence in the tasks covered by the unit

Graduate Competencies

The units of competency that have been assessed and actually attained by a graduate upon successful completion of a VET competency program, based upon a nationally endorsed training package qualification or a VET accredited course

Specified Units of Competency

The units of competency selected as targeted competency outcomes for a VET competency

program from the options provided within a nationally endorsed training package qualification or a VET accredited course

Stakeholder Competency Requirements

The competencies identified as necessary vocational outcomes by industry advisers and other appropriate external stakeholders, and which inform the RTO in the final selection of the Specified Units of Competency

Actual Vocational Outcomes

The overarching occupational or job specific outcomes which learners actually achieve and demonstrate upon the completion of a VET competency program based on a nationally endorsed training package or VET accredited course

Intended Vocational Outcomes

The overarching occupational or job-specific outcomes that are targeted by the RTO, under the guidance of stakeholder groups, at the start of the competency development process

Performance Criteria

The part of a Unit of Competency that specifies the required level of performance to be demonstrated by learners to be deemed competent

Outcomes terminology at the level of a ***Program*** (see Figure 1):

Engineers Australia Stage 1 Competency Standards

Specified units of competency

Core units of competency

Elective units of competency

Graduate competencies

Outcomes terminology at the level of a ***Unit of Competency*** (see Figure 1):

Elements

Performance Criteria:

1.4.2 Acronyms

ASQA	Australian Skills Quality Authority
AISC	Australian Industry and Skills Committee
AQF	Australian Qualifications Framework
CE	Competency (Operational) Environment
CP	Competency Program
CQ	Competency Quality (Systems)
EA	Engineers Australia or Engineering Associate
ET	Engineering Technologist
IEA	International Engineering Alliance
PE	Professional Engineer
RTO	Registered Training Organisation

RPL Recognition of Prior Learning

RCC Recognition of Current Competencies

VET Vocational Education and Training

1.5 References

[1] International Engineering Alliance Graduate Attributes and Competency Standards, Version 3.0, 21 June 2013

[2] International Engineering Alliance and European Network for Engineering Education. Best Practice in Accreditation of Engineering Programmes: An Exemplar, 13 April 2015 (joint document)

[3] Engineers Australia Stage 1 Competency Standard – Professional Engineer

[4] Engineers Australia Stage 1 Competency Standard – Engineering Technologist

[5] Engineers Australia Stage 1 Competency Standard – Engineering Associate

[6] AMS-POL-01 Accreditation Principles

[7] AMS-STD-20 Accreditation Standard – VET

[8] AMS-MAN-21 Procedures Manual – VET

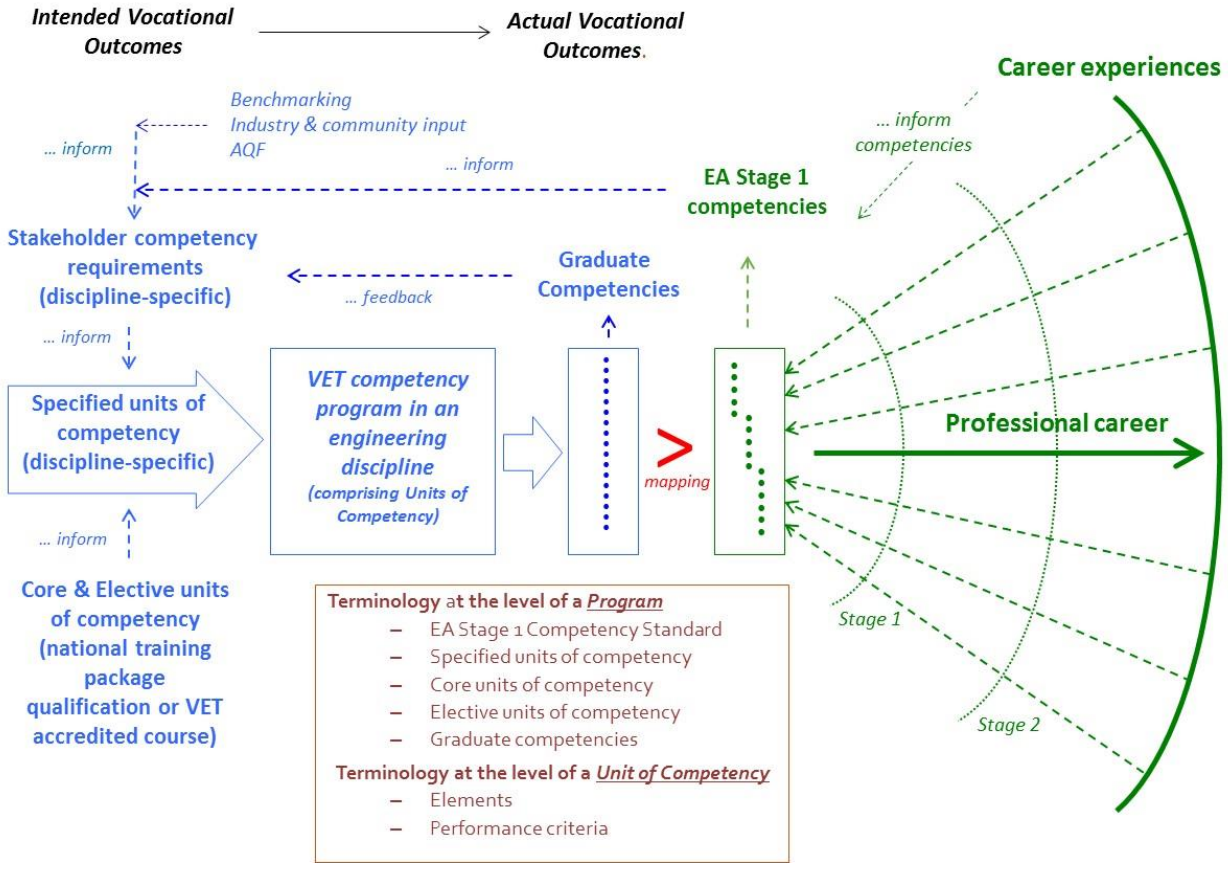
[9] Australian Qualifications Framework, Australian Government Department of Education and Training, Version 2, January 2013

2. Introduction

Accreditation is an evidence-based evaluation process of education and VET competency-based programs against a set of defined accreditation standards, usually referred as accreditation criteria. Accordingly, the accreditation criteria incorporate (but are not limited to) professional competency standards that the profession deems as the minimum required for graduates to enter the profession. In Australia, these standards are known as the Engineers Australia Stage 1 Competency Standards (References [3] to [5]).

In the case of VET competency-based programs the evaluation process assesses the suitability of the program to prepare graduates to enter engineering professional practice in the occupational category of Engineering Associate. The applicable standard (Reference [5]) has been developed over time by incorporating feedback from the career experiences of practising engineering associates. This feedback process is illustrated in Figure 1 (below).

Figure 1 Diagram depicting the influence of the EA Stage 1 Competency – Engineering Associate



The Engineers Australia Stage 1 Competency Standards define 16 generic competencies that

are the expected attributes of early career professionals. These competencies are organised into three domains:

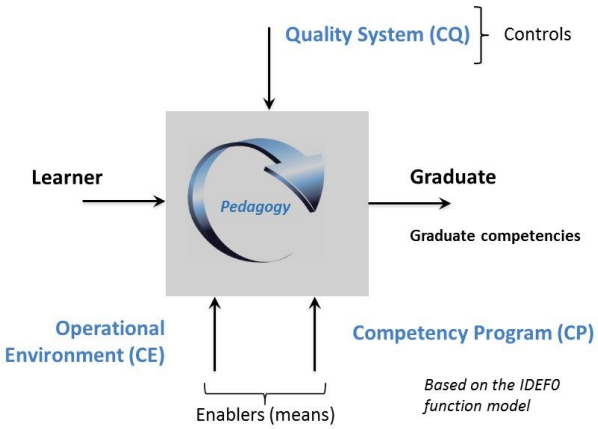
- Professional and personal attributes, which highlight the human side of engineering practice
- Knowledge and skill base, which expand on the technical side of engineering practice
- Engineering application ability (especially design), which is the creative bridge between human needs and the technical elements of the solution

The EA Stage 1 Competency Standard for Engineering Associate also defines the intended graduate outcomes of an EA accredited VET competency program. Individuals, however, are not accredited. In EA accreditation, the design of the VET competency program is evaluated in detail through a set of criteria that assess how the graduate competencies are developed across the program as implemented. In the EA accreditation system, these are known as Competency Program (CP) criteria. They are used largely to evaluate the program in its present state. All the graduates of an accredited program are deemed to have attained all of the generic Stage 1 competencies at or above a minimum or threshold level.

The normal duration of accreditation is five years, so an accreditation review panel (evaluation panel) needs to be confident that the achieved accreditation standard at the time of the evaluation (present state) will be maintained throughout the five years (future state) of the accreditation cycle. Two other sets of accreditation criteria are employed to do this: Operating Environment (CE) criteria, and Quality Systems (CQ) criteria. The Quality Systems criteria also evaluate the capacity for continuous quality improvement of the VET competency program over the five years accreditation cycle. The prefix "C" is employed to distinguish VET competency criteria (CP, CE, CQ) from criteria developed for higher education programs (AP, OE, QS).

The three components that comprise the EA Accreditation Criteria can be conceptualized in an engineering-style function model of a VET competency program (Figure 2). In the function model, the CP and CE components are enablers of the VET function, while the CQ component is a control function. This conceptualisation differs from that employed in much of the broader education and VET community, where all three sets are loosely classified as "inputs". The function model allows a richer discussion and deeper evaluation of the VET function.

Figure 2 Function model of a VET program



Accreditation is an evidence-based activity; accordingly, RTOs are required to provide not just claims of compliance, but unambiguous evidence (provided during the on-site visit as well as in the self-study report) of program and RTO performance against each criterion. For accreditation, each criterion must be satisfied.

This User Guide has been prepared as a supplement to Reference [7] that provides the criteria for accreditation and lists the forms of evidence that substantiate compliance. In the following sections, each criterion is developed more fully to explain the key requirements for compliance.

Some items of evidence have been identified as essential both because of their characteristics and from accreditation experience and advice. Accordingly, statements containing '**must'** denote essential elements to be addressed. Statements containing '**should'** are not individually binding but for accreditation to be granted, it is expected that the program will address a high proportion of them.

Innovation and diversity in learning and assessment design, delivery, and quality processes are encouraged, in accordance with the principles of outcomes-based accreditation.

3. Competency Program

The Accreditation Board will look for evidence that the specified units of competency and the intended vocational outcomes for a particular VET competency-based program implementation are aligned with the Engineers Australia Stage 1 Competency Standard for the Engineering Associate and that the program is commensurate with the range and depth expected by employers and is consistent with national and international practice.

In judging the adequacy of a VET competency program and its implementation framework, the accreditation process will evaluate the approaches and steps taken in the program learning and assessment design process, and the selection, packaging, implementation and delivery of the specified units of competency. Demonstrated mapping of the learning activities and assessment tasks to the unit elements and performance criteria and their aggregation should validate and verify that the program is aligned with the Engineers Australia Stage 1 Competency Standard for Engineering Associate.

3.1 CP1 Development of the vocational specification for a competency-based VET program

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Purpose: To establish an unambiguous specification for the VET program design, clearly aligned with and driven by the EA Stage 1 Competency Standard for Engineering Associate.

Suggested evidence of attainment:

- **a.** An entry to practice AQF6 program that is designed to meet and align with the Engineers Australia Stage 1 Competency Standard for Engineering Associate in a clearly identified engineering discipline, and with a matching and appropriate program title
- **b.** Explicit and comprehensive competency program specification consistent with the guidelines for a nationally endorsed training package AQF qualification, or a VET accredited AQF course, and which encompasses:
  - **i.** A sound rationale for the selection and packaging of specified units of competency, based on analysis of industry, enterprise and community needs, trends in engineering professional practice, use of benchmark indicators, graduate and key stakeholder feedback
  - **ii.** Explicit mapping to demonstrate alignment of the specified units of competency with the generic competency elements of the Engineers Australia Stage 1 Competency Standard for Engineering Associate, (and therefore the IEA/Dublin Accord expectations), and with specific details of the technical knowledge and engineering application skills that are uniquely targeted for the designated engineering specialisation
  - **iii.** Alignment between the specified units of competency and the intended vocational outcomes of the program
- **c.** Ongoing evaluation of engineering practices, industry needs and demand, to maintain the relevance of the specified units of competency

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Each program submitted for accreditation must be an entry to practice program in a clearly identified engineering discipline. The program must be supported by a specification of intended vocational outcomes that are aligned with the specified units of competency for the program, and which also incorporates the EA Stage 1 Competency Standard for Engineering Associate (Reference [5]). As noted earlier, this standard defines 16 generic engineering competencies and corresponding indicators of performance under the headings of Knowledge

and Skills Base, Engineering Application Ability and Professional and Personal Attributes. The standard provides a generic framework for expressing the vocational outcomes appropriate to the designated technical field of practice and/or specialisation(s) of the program. Graduates are expected to be able to deploy these attributes in their field of practice during the first year of their career formation following graduation. The EA standard is consistent with the IEA Dublin Accord graduate attribute exemplar (Ref [1]).

An EA accredited VET competency-based program in engineering implemented in Australia will be either a nationally endorsed training package AQF level 6 qualification, or a VET accredited AQF level 6 course (see CP3).

The key requirement for an EA accredited program is that it engages learners with a coherent area of engineering practice, appropriate to the occupational category of Engineering Associate. The program will focus on establishing competence in well-defined engineering science and technologies and practice (including technical and operations management) but also include an appreciation of current technical issues. The specification of intended program vocational outcomes must make clear the program's particular field(s) of practice and associated area(s) of specialisation. The specification should also justify the inclusion or omission of any specialist title for the program or the awarded qualification.

To be eligible for accreditation, a program must include the word engineering and/or technology in its title and, unless the circumstances are exceptional, must lead to a qualification that includes the word engineering and/or technology in its title. The designated field of engineering practice will commonly be reflected in the title of the program and/or qualification or be cited as a major field of learning in the statement of attainment. It is not essential however for any further specialisation to appear in the program or qualification title.

Where a title denotes specialisation in a particular field of practice, the program must impart an appropriate level of technical skills and knowledge in that specialisation. A program that omits coverage of substantial topics in the field implied by the title, in which a graduate in that field could reasonably be expected to have competence, would *not* be accredited.

New program titles may be expected to arise in response to evolving industry practice. Programs may draw on several existing fields of specialisation and may incorporate new knowledge or the application of knowledge in new practice environments. The Accreditation Board does not wish to be prescriptive about titles, nor does it wish to encourage a proliferation of specialist titles that may be transitory or have short term lifetimes. It reserves the right to query a title or field of practice which it regards as inappropriate, or to decline to accord accreditation.

When developing an engineering VET competency-based program implementation, the engineering school will need to make evidence-based decisions on the breadth and depth of coverage of the field of practice and selected specialist areas. The program's intended vocational outcomes specification and selection, packaging, implementation and delivery of the specified units of competency should be based on sound rationale, including analysis of industry, enterprise and community needs, emerging trends in engineering professional

practice, use of benchmark indicators, graduate and key stakeholder feedback. External stakeholder input is critical to the development, review and monitoring of attainment of the specified units of competency and the intended vocational outcomes specified for the program (see CP2 f and CQ1).

The elements and performance criteria from the specified units of competency must aggregate to both the intended program vocational outcomes and the EA Stage 1 Competency Standard. The latter may be demonstrated by explicit mapping of the intended vocational outcomes aligned with the units of competency specified for the program against the EA Stage 1 Competency Standard for Engineering Associate. This outcomes based mapping should demonstrate the contributions of specific technical knowledge and engineering application skills for the designated engineering discipline, as well as the development of the generic skills, knowledge and personal and professional attributes that are relevant to all fields of practice. The program – and hence the mapping – should encompass a balanced and integrated development of learner capabilities. Appropriate breadth and depth of competence must be clearly demonstrated in the technical domains comprising the field of practice and through appropriate levels of knowledge and skills in nominated specialist areas. Mapping of the learning and assessment of units of competency is discussed further under CP5.

The specified units of competency and the intended vocational outcomes specification for the program should be aligned and support the purpose of the RTO, the career aspirations of learners as well as any specialist technical focus, anticipated career destinations of graduates, and the needs of appropriate external stakeholders.

The intended vocational outcomes specification and the selection, packaging, implementation and delivery of the specified units of competency for the program should also be informed by the ongoing evaluation of changes in VET regulation and practice, engineering practice, industry needs and demands.

3.2 CP2 Approach to program learning and assessment design.

Purpose: To explain the approach and processes employed to achieve the design of the learning and assessment program.

Suggested evidence of attainment:

- **a.** Systematic and formalised top down/bottom up processes in place for identifying, reviewing and verifying the selection and packaging of the specified units of competency, commensurate with the designated field of engineering practice and specialist focus
- **b.** Systematic use of a diverse range of individual and collaborative learning approaches to support structured, discovery and investigatory learning within the designated field of engineering practice
- **c.** Mapped alignment of learning strategies and assessment tasks with the individual elements of competency and associated performance criteria, validating the development and attainment of the specified units of competency, and thus the intended vocational outcomes of the program
- **d.** Competency program which provides progressive emphasis on independent self-directed learning, reflective practices, critical review, peer review and self-assessment
- **e.** Inclusion of reflective, self-assessment processes, referenced to the designated elements of competency and

associated performance criteria, and which enable learners to track progressive development of their graduate competencies, ultimately matching the specified units of competency and thus the intended vocational outcomes for the program

f. Systematic program review processes in place, inclusive of all teaching staff, and with ongoing input from learners, industry advisers and other key external stakeholders, that:

i. Is holistic and outcomes driven

ii. Addresses the full range of the programs' specified units of competency and thus the intended vocational outcomes

iii. Tracks benchmarked practices, industry needs and learner demand

iv. Is specific to each program

Also see CP4 and CP5

There should be formal, documented processes for the initial selection and systematic review and revision of the specified units of competency and the intended vocational outcome objectives of each program.

As discussed earlier, the specified units of competency must deliver the intended vocational outcomes for the program. They provide the platform for the learning, delivery and assessment design of the program ((CP4, CP5). A structured, 'top-down' approach to learning and assessment program design should determine the specific learning activities and assessment tasks linked to the elements and performance criteria for each of the specified units of competency. In addition, there should be 'bottom-up' mapping, tracking and aggregating of the unit learning activities, assessment tasks linked to the elements and performance criteria that can be used to validate and verify alignment of the overall program outcomes with the EA Stage 1 Competency Standards for the Engineering Associate.

The overall goal of the learning and assessment program design process is to ensure that the VET competency program as a whole addresses the intended vocational outcomes identified for the program in a substantial, coherent and explicit way. The design must cover the technical requirements of the specific engineering discipline and relevant contextual and generic factors.

Learning and assessment design

The program should use a diverse range of individual and collaborative learning approaches to support structured, discovery and investigatory learning within the designated field of engineering practice.

The development of generic personal and professional skills should be emphasised. The *mandatory* Foundation Skills requirement of a nationally endorsed training package qualification or a VET accredited course addresses: reading, writing, oral communication, numeracy, learning, problem solving, initiative and enterprise, teamwork, planning and organising, self-management and information technology. These skills should be further developed as the integrated generic skills components of subsequent units of competency. Learners' generic skills would then be assessed on an as required basis within the elements and performance criteria of each of the specified units of competency that comprise the program.

To take the example of oral communications, there should be a series of structured exercises (such as team projects and outreach activities) that expressly require learners to use effective oral communication to a professional standard on engineering topics and issues. These should be aimed at a technical level between peers and at non-technical level with other professionals or the broader community. Such exercises should involve conveying well-defined ideas, receiving responses, and subsequently responding in a logical manner. Multiple opportunities should be provided, for learners with different temperaments, learning styles and backgrounds.

It would not be sufficient to expect that an adequate oral communications skill level would be established within one or two dedicated tasks or units of competency at particular points in the program's delivery. Nor would it be sufficient to claim that all or most of the specified units of competency involve oral communication in one form or another, and no further explicit attention is necessary.

The above approach should be followed embedding and delivering other generic skills throughout the program.

At the level of the specified unit of competency, the learning, delivery and assessment design process should develop appropriate learning activities that are linked to the unit elements, with diagnostic, formative and summative assessment tasks linked to the performance criteria which facilitate the attainment of each of the specified units of competency. Closing the loop on learning activities, assessment tasks and performance criteria for each specified unit of competency level should be a prime objective of the overall program design.

In addition, the EA Stage 1 Competency Standard, Engineers Australia has determined *indicative* proportions of the total learning experience, in terms of learner effort, as in the following table (see AMS-MAN-10). These need to be considered in the overall program design.

Figure 3 Indicative proportions of learning for an Engineering Associate qualification

Underpinning mathematics, science, engineering principles, skills and tools appropriate to the discipline of study and qualification	**30%**
Engineering design and projects	**30%**
An engineering discipline specialisation	**15%**
Integrated exposure to professional engineering practice, including management and professional ethics (approximately 10%)	**15%**
More of any of the above elements, or other elective studies	**10%**

These proportions are not mutually exclusive. Some relate principally to content, and others relate more to learning processes. A particular learning activity may consist of several of these elements. Likewise, a particular learning activity may concurrently contribute to various vocational outcomes ranging through personal/professional, problem solving/design, enabling and specialist technical categories.

Substantial departure from these proportions of the learning experience must be justified as being consistent with the attainment of the specified units of competency and the intended vocational outcomes specified for the program and concurrently maintaining corresponding alignment with the EA Stage 1 Competency Standard for Engineering Associate.

A systematic mapping of the learning activities and assessment tasks for each specified unit of competency to the EA Stage 1 Competency Standard for Engineering Associate should be a prime reference tool emerging from the program design processes. Subsequent aggregation of the unit learning activities and assessment tasks to close the loop on the delivery and assessment at the overall program level validates the overall program learning and assessment design, and supports the on-going review and continuous quality improvement processes.

The program learning and assessment design should promote a graded transition from structured to more independent learning. The early stages of the program delivery should be tailored to the individual backgrounds of the commencing learners and should provide appropriate pathways for each group of learners who commence the program. This should include special support programs for learners admitted from disadvantaged or unconventional backgrounds, or for those with language difficulties (see also CE4).

There should be increasing emphasis on learning activities that involve reflective practice, critical thinking and self-review, and the use of peer and self-assessment as the program progresses. Learners would typically be required to develop their skills in these areas through learning activities that are associated with engineering applications invoking synthesis, design and the solution to well-defined problems.

In summary, documentation of the learning and assessment program design should clearly demonstrate the following:

- individual learning activities that systematically aggregate to deliver each of the specified units of competency
- associated assessment methodologies that are aligned collectively to validate the attainment of each specified unit of competency
- use of 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 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 that acknowledges engineering contexts, and the global nature of engineering practice

Program and unit assessment

Assessment of any pathway leading to a nationally recognised AQF qualification and or statements of attainment in the VET sector must meet the requirements of the Assessment

Guidelines of the competency program as well as the national VET quality framework or its state government equivalent.

For EA accreditation, the assessment regime should address the full range of the program's vocational outcomes and the EA Stage 1 Competency Standard for Engineering Associate, including personal and professional skills development. By inclusion of self-reflection and self-review processes, learners should be enabled to track progressive development of their graduate competencies, by matching their attainment of the specified units of competency and ultimately, the intended vocational outcomes for the program.

The development of assessment tasks and learner performance monitoring must be a systematic and an integral part of the learning and assessment program design. The assessment tasks must be aligned with the intended vocational outcomes that are linked, in turn, to the EA Stage 1 Competency Standard. The assessment processes should comply with the principles of assessment which include being fair, flexible, valid, reliable and sufficient. In addition, they should be authentic with respect to current engineering practice. The assessment tasks should be sufficiently comprehensive and diverse to provide systematic opportunities for learners to demonstrate progress towards the development of their competence and professional standards.

There should be evidence that the assessment tools and tasks within the individual units of competency that comprise the program are rigorously and explicitly aligned with each of the performance criteria of each of the specified unit of competency. There should also be evidence that credible and consistent processes are in place for judging the quality of learners' performance in assessment tasks.

The assessment tools and tasks should include diagnostic, formative and summative methods. These may include direct observations, examinations, tests, quizzes, project reports, simulations, seminar and project presentations, self, peer, and mentor appraisals, log books, portfolios and journals, oral examinations and interviews and behavioural observations in a work place or simulated work place context. All assessment must be rigorously aligned with performance criteria, performance evidence, knowledge evidence and assessment conditions of each of the program's specified units of competency. Assessments should be selected, timed and sequenced to validate attainment of the units of competency specified for the program.

Moderation of assessment tasks should be part of the assessment design for each unit of competency. Moderation of assessment results is generally conducted for each unit of competency before the aggregation and finalisation of all learner assessment results. Moderation processes should be applied to ensure the consistency of all assessments within and between the specified units of competency.

The evaluation panel will seek a wide range of evidence of learner activity and assessments, that may include assessed work and examination scripts, practical demonstrations or simulations, third party reports on learners, questioning and interviews, learners' personal statements or resumés, workplace documents, training records, learners' reports of case

studies and projects, reflective journal or diary, testimonials and awards, and portfolios.

Program review

A systematic approach to program review must be evident. Review and improvement processes should be inclusive of all staff engaged in the delivery and assessment of the program and involve the on-going input of external stakeholders (see CQ1) as well as feedback and input from learners (see CQ2). Reviews must be appropriately informed by ongoing evaluation of engineering practice; the industry and employer need and demands.

There should be a rigorous process in place to validate and review the quality of the assessment processes. The validation process typically involves checking that the assessment tools and methods produces valid, reliable, sufficient, current and authentic evidence to enable reasonable judgments to be made as to whether the assessment requirements of the nationally endorsed training package qualification or VET accredited course are being or have been met. Furthermore, validation includes reviewing a statistically valid sample of the assessments and making recommendations for future improvements to the assessment tool, process and/or outcomes and acting upon such recommendations.

Program reviews should be specific to each program and consider the full range of each program's specified units of competency and intended vocational outcomes. Review processes should ensure that the outcomes specification is appropriate for the program, and that it maintains a focus on outcomes delivering the required generic and discipline specific skills and knowledge aligned with the EA Stage 1 Competency Standard for Engineering Associate, external practices and specific industry needs. As with the development of the intended vocational outcomes specification, external stakeholder input is essential to the review and revision of these outcomes to accommodate changing needs of industry and the broader community, emerging trends in professional practice and comparisons with programs of similar nature available both nationally and internationally.

3.3 CP3 Program structure and implementation framework

Purpose: To articulate the learning and assessment concepts and program structure resulting from the application of a nationally endorsed training package AQF qualification or a VET accredited AQF course

Suggested evidence of attainment:

- **a.** Program structure compatible with delivery of the specified units of competency and consistent with the guidelines for a nationally endorsed training package AQF qualification or a VET accredited AQF course
- **b.** Alternative learning and assessment pathways that appropriately embrace core and elective unit choices, prerequisites and/or co-requisites, access and equity, RPL/RCC arrangements, on campus, off campus, credit transfer and designated articulation routes providing equivalent vocational outcomes for the program.
- **c.** Adequate processes in place for analysing and monitoring the learning and assessment outcomes from alternative delivery pathways
- **d.** Flexibility of program structure allowing learners with advanced standing to progress; and program implementation accommodating the diversity of learner backgrounds and individual learning styles and abilities (covered in CE4 g.)

e. An approach to program learning and assessment design which recognises that engineering practice is global in nature, often with multi-national engineering teams engaged in systems, processes, projects and products that have global application

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The program structure must be appropriate to enable the delivery of the specified units of competency and the development of the intended vocational outcomes specified for the program including in depth technical competence in the designated field of practice and in nominated specialist areas.

Furthermore, the program structure must be consistent with the implementation requirements of a competency based Australian VET program. This can be either: a nationally endorsed training package AQF qualification; or a VET accredited AQF course. For the occupational category of Engineering Associate, the designated AQF qualification is the Advanced Diploma of Engineering at AQF level 6 (Ref [9]). The volume of learning for this qualification is two years of full-time-equivalent learning, nominally with the post attainment of a secondary school certificate or alternatively other modes of entry deemed acceptable to the RTO.

The typical teaching year for a VET competency program in engineering involves two semesters of eighteen weeks. Each semester involves formal learning activities and assessment tasks which should enable learners to become self-directed and suit their individual learning styles and capabilities as the program is delivered. The program structure is normally defined for full-time study for school leavers who have satisfactorily completed their Year 12 secondary school certificate or alternatively other modes of entry deemed acceptable to the RTO.

In all cases, for EA accreditation of a VET competency-based program, the Accreditation Board will require the current accreditation policies and criteria to be met and demonstrated in full.

In considering any program that offers completion in significantly less time than the specified volumes of learning, the Accreditation Board will need to be assured that the program provides adequate opportunity for learners' personal and professional skills development and the full equivalence of the intended vocational outcomes.

Program durations exceeding the normal full-time study volume of learning may be appropriate in some circumstances. In such cases, accreditation evaluation will be based on the demonstrated delivery of the specified units of competency and the intended vocational outcomes for the program, commensurate with the EA Stage 1 Competency Standard for Engineering Associate and appropriate to the designated field of engineering practice.

Programs offered via alternative implementation pathways that appropriately embrace options such as core and elective unit choices, prerequisites and/or co-requisites, access and equity, RPL/RCC arrangements, on campus, off campus, credit transfer and designated articulation routes must provide equivalent intended vocational outcomes. Alternative delivery options must be demonstrably equivalent in terms of content and assessment and the learning expectations of learners.

Flexible delivery options are usually implemented as alternative implementation pathways within a single program definition. Such pathways can range from specialised entry routes, core and variations of electives units of competency, clustering of units of competency to facilitate capstone project options, workplace learning, online learning, distance mode and articulation pathways. All program pathways must deliver equivalent intended vocational outcomes to each learner.

The program structure should have sufficient flexibility to accommodate effective articulation pathways that facilitate the transfer and progression of learners from other related programs of learning (either domestic or international). Articulation pathways generally enable the recognition of successful, relevant learning completed at another RTO with which the primary RTO will have under the national VET quality framework or state regulatory equivalent, a formal process of mutual recognition that includes the recognition of the specified units of competency. There may also be recognition of other forms of formal and informal learning that require conducting an RPL and or RCC process by gathering a portfolio of evidence from each learner seeking recognition. Articulation pathways and corresponding credit transfer arrangements and admissions must be supported by rigorous processes in order to assure learners' successful transition. Systematic documentation of the learning and assessment program design (see CP2) is crucial for underpinning the evaluation of articulation pathways and the award of credit.

There must be rigorous documented processes for analysing, monitoring and managing alternative implementation pathways and delivery modes within a particular program definition, and for assuring the equivalence of the intended vocational outcomes for the program as a whole.

If an RTO provides a learner with more than 50% of the credit for the specified units of competency that comprise the VET competency program being considered for evaluation, then the EA evaluation panel will need to be provided with a detailed appraisal of how the RTO provided the learner with the credited units of competency.

The program structure should facilitate an integrated approach to developing learners':

- enabling skills and knowledge
- in-depth technical competence in the nominated field of specialisation
- practical and laboratory learning, problem solving design and project-based learning
- personal and professional capabilities
- understanding of relevant engineering practice

More detailed exposition of learning and assessment is addressed in CP4 and CP5.

The program structure should be sufficiently flexible to provide for variance in the learners' background and prior formal and informal learning, as well as for their individual differences in learning styles and abilities.

The program structure should also be able to accommodate and promote the globalised nature of engineering practice and expectations arising from associated international mobility

of engineering practitioners and learners. Learners should have opportunities to be involved in teamwork, often across many disciplines. The program structure should therefore be able to accommodate inward and outward movements of domestic and international learners and their participation in onshore and offshore learning activities. Such activities contribute to the internationalisation of engineering vocational education and training and assist learners' preparation for practice in international domains. These processes underpin the realisation of the IEA Dublin Accord agreement, increasing international program recognition and graduate mobility between Dublin Accord signatory countries.

3.4 CP4 Engagement with professional practice

Purpose: To describe how professional competencies are developed throughout the entire program

CP4 and CP5 should be addressed together

Suggested evidence of attainment:

- **a.** Engagement with professional practice (other than formal work placement), used as an integrated learning activity embedded as part of the development of specified units of competency and contributing in a clearly defined manner to the achievement of the intended vocational outcomes of the program
- **b.** Formal work placements, where implemented, are documented with intended learning strategies mapped to the elements of the specified units of competency for the program
- **c.** For learners not concurrently employed in an appropriate engineering field of practice, exposure to engineering practice equivalent to at least (6) weeks of full-time, continuous engineering experience in an industrial workplace
- **d.** Appropriate systems for recording, tracking and assessing the learning strategies associated with exposure to industry practices (such as e-portfolios, learner reflective journal).
- **e.** Experience with the working of engineering teams

Sound professional judgement is expected of experienced engineering associates in all occupations, defining the vision for the professional journey from engineering learner to competent practitioner as an engineering associate. An engineering associate acts to meet an obligation in relation to an engineering task, requiring professional judgement to be applied and a decision to be made. The result is offered as a responsible, reliable and useful output of a professional, fit for downstream use by others.

The guiding objective for engagement with professional practice (EPP) in formal engineering VET learning is to initiate the development of sound professional work practices and methods that underpin reliable professional judgement and decision-making, and to embed these work practices and methods so that they continue beyond the VET competency program. Engineering learners need, in addition to knowledge, formative experiences of how engineering professionals:

a) Think, work and continually learn
b) Develop professional judgment
c) Make decisions while conforming with the EA Code of Ethics

d) Earn the trust of all stakeholders in those decisions

Professional practice experiences need to be delivered in environments (which may be simulated, virtual, industry, or a mix of these) that provide experiential learning. These environments are materially different from the usual formal VET learning environment offered by an RTO. These differences, which offer guidance to the development of simulated or virtual environments, include:

- Systems for managing work – all engineering organisations have documented work practices and procedures that facilitate the orderly management of the tasks undertaken by engineering associates
- Professional communications – communications in the professional workplace are very different from learner communications, especially when communicating with clients
- Modelling of professional behaviours – constructive role models of professional behaviour are powerful in the development of professionalism
- Constraints of commerce – in the delivery of an engineering task, engineering associates do not work in isolation, interacting with other business functions that are part of the broader business team, constraining how engineers deliver their outputs
- Experiences "in the wild" – the professional work environment is subject to many inputs and disturbances that are not under the control of the engineering team, potentially disrupting normal work activities

Suitable formative experiences may be provided both from within the VET competency program and from a separate professional environment. The nature of the separate environment and the extent of its engagement is not prescribed, but Engineers Australia strongly advocates that all engineering learners be required to build a meaningful portion of their experiences from workplaces where engineering associates exercise professional judgment in the practice of engineering.

Preparation must begin within the VET competency program to provide a practice framework for subsequent experiential learning experiences, regardless of where and how the formative professional experience is obtained. Engagement with professional practice must be an integral learning activity within the learning and assessment program design and make a significant and planned contribution to the delivery of graduate competencies. The objectives of EPP need to be understood by all stakeholders (engineering learners, staff and supervising engineers), they must be documented as formal learning activities within the VET competency program and mapped to the EA Stage 1 Competency Standard for Engineering Associate.

There should be formal monitoring and assessment of the learning experiences aligned to the elements associated with EPP through, for example, use of a reflective journal or portfolio system where learners record and reflect on their experiences against the targeted graduate competencies.

EPP must culminate in a set of meaningful experiences that result in the habituation of professional working styles through placement in activities engaged in actual or simulated

commerce, internships, volunteering or similar activities.

In addition, EPP could include, but is not limited to, a combination of the following:

1) Systematic contact with practising professionals, for example, through on-going project reviews, mentoring, or professional society activities
2) Engineering information management, especially management of an engineering baseline
3) Direct industry input to authentic problem-solving, projects and evaluation tasks
4) Industry-based investigations and case studies, including final year projects
5) Industrial site visits that are structured and contribute to the attainment of elements of the specified units of competency from an engineering VET competency program.
6) Inclusion of staff with industry experience in engineering VET competency program delivery
7) Guest lectures by industry practitioners
8) Application of industry standards, codes, practices and methods
9) Structured interviews of engineering professionals

The outcome should be that engineering learners are able to aggregate different learning experiences towards their portfolio of EPP. For maximum pedagogical value, VET competency programs should be designed to enable learners to complete this requirement prior to the final learning period (semester, trimester, term, etc). The recommended EPP for a VET competency program is nominally the equivalent of 30 days (6 weeks) in an engineering workplace placement. For accreditation, documentation must be provided explaining how the various learning experiences aggregate to contribute to the equivalent 30 days, and how they contribute to the overall learning and assessment program design. The overall EPP learning experiences should enhance a graduate's capacity to move with ease into a professional workplace.

Where EPP is incorporated within the two-year equivalent VET competency program which enables the attainment of specified units of competency from the program, these must embody assessable requirements comparable with other elements of learning that attract similar or equivalent credit. Where elements of EPP activity occur outside of VET competency program, appropriate assessment of claims against the professional outcomes must likewise be demonstrable to an accreditation evaluation panel.

3.5 CP5 Program learning strategies (includes learning materials & content, pedagogy & assessment)

Purpose: To verify that the program specification is achieved in the detail design

CP5 and CP4 should be addressed together

Suggested evidence of attainment:

a. Systematic alignment and aggregation of the elements and performance criteria from each unit of

competency, consistent with delivery of the intended vocational outcomes of the program

b. Clearly mapped linkages between the elements, underpinning knowledge, performance criteria, learning strategies and assessment tasks within each of the specified units of competency

c. Appropriate use of clustering of selected units of competency to facilitate problem-based and/or project-based learning

d. Evidence that the Engineers Australia content guidelines (AMS MAN 10) informs the program learning strategies and delivery

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An integrated and pervasive approach to the detailed learning and assessment design of a program must focus on the selection of the specified units of competency prescribed for the designated program and how they contribute to the attainment of the intended vocational outcomes for the program as a whole. The specified units of competency will be delivered through a wide range of learning activities and assessment tasks spread throughout all stages of the program delivery.

The accumulated output of all program learning activities and assessment tasks must rigorously and explicitly confirm the delivery of the specified units of competency and the intended vocational outcomes specification of the program as a whole. This may be done by systematic mapping (see CP2 c) of the aggregation of the unit learning activities to the unit elements and the assessment tasks to the unit performance criteria for each unit of competency specified for the program.

Where the specified units of competency aggregate to align with the EA Stage 1 Competency Standard for the Engineering Associate, then the attainment of the generic competencies and elements of competency that comprise the Standard will be assured through the learning and assessment design and mapping processes for each unit of competency.

Each of the specified units of competency must comprise an integrated set of practical tasks and structured learning activities together with assessment tools and tasks that lead to the delivery and attainment of the program's specified units of competency and intended vocational outcomes. Learning support mechanisms must be provided, as necessary, to support the achievement of the intended vocational outcomes.

To facilitate problem and or project-based learning, the Accreditation Board will look for evidence that the engineering school is effectively utilising the clustering of selected units of competency from the program. The clustering of selected units of competency can be used to facilitate a series projects throughout the delivery of the program as well as provide the basis for the delivery of the final year capstone project that synthesises learning experiences across the whole program.

Detailed learning and assessment design is supported by the EA Stage 1 Competency Standard, via the detailed indicators for each graduate capability. Further guidance is provided by the expected proportions of the learning experience (see 3.2). The learning and assessment requirements identified in each specified unit of competence must be conveyed to learners.

The detailed content of each unit of competency in a program must also comply with the

requirements of the templates specified in the current versions of the Standards for Training Packages or the Standards for VET Accredited Courses. The information for the unit of competency template includes the unit code, unit title or description, application, prerequisite units, competency field, unit sector, elements, performance criteria, foundation skills, range of conditions, unit mapping information and links to other relevant documentation. Similarly, the completed content for the associated assessment requirements template includes the unit title, performance evidence, knowledge evidence, assessment conditions as well as and links to other relevant documentation.

Completed unit of competency templates together with the associated assessment requirement templates for the program should be made available to learners and other stakeholders in a timely manner (see CQ4). Completed unit of competency templates together with the associated assessment requirement templates should be a key resource for program learning and assessment design and planning, implementation and quality assurance and should be regularly revised and up dated as part of the continuous improvement process.

The following paragraphs summarise the key areas of learning.

Enabling Knowledge and Skills: Enabling skills and knowledge in mathematics; physical, life and information sciences, and in engineering fundamentals must adequately underpin the development of appropriate levels of technical capabilities, and engineering application work within the designated field of practice and selected specialisation(s).

Technical Competence: Graduates generally should have appropriate levels of in-depth knowledge of the major technical areas comprising the field of practice and competence in applying mathematics, science and engineering science to the analysis and solution of well-defined problems, situations and challenges in those areas.

Graduates should have an ability to ensure that all aspects of a project or program are soundly based in theory and fundamental principles and to recognise assumptions, results, calculations or proposals that may be ill founded, identify the underlying source and nature of the problem and take corrective action.

Engineering Application Experience: Engineering application activities should pervade the program learning and assessment design and include the solution to well-defined problems, design and project work. It is expected that programs will embody at least one major engineering capstone project experience, which draws on technical knowledge and skills, problem solving capabilities and design skills from several parts of the program and incorporate broad contextual considerations as part of a full project life cycle.

Learners should engage with well-defined and open-ended problems and work in both individual and team-based capacities. The program should also develop engineering design capability, appropriate to the field of practice. Ideally a program will contain multiple design tasks, research and project activities spread throughout the various levels. Engineering Associates are often required to be closely familiar with standards and codes of practice as well as the use of advanced computer software tools to perform detailed design tasks.

Engineering application work should be representative of the field of practice and include technical and non-technical considerations. A key objective should be to develop an appreciation of the interactions between technical systems and the social, cultural, ethical, legal, political, environmental and economic context in which they operate.

Personal and Professional Skills Development: The development of personal and professional skills should be addressed by the program as a whole. An integrated and pervasive learning and assessment program design approach will map the development of these skills through a wide range of learning activities and assessment tasks spread throughout all stages of the program.

Practical and 'Hands-On' Experience

There must be substantial hands-on practical experience manifested through specifically designed laboratory activities, simulations, investigatory assignments and project work. The specific learning contributions from practical work should be thoroughly understood, mapped and documented as an integral part of the learning and assessment design process within the various units of competency that comprise the program. Practical learning activities should engage learners with the use of facilities, equipment and instrumentation reflective of current industry practice.

4. Operating Environment

4.1 CE1 Organisational structure and commitment to engineering vocational education & training

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Purpose: To show how the RTO is aligned to deliver the program

Suggested evidence of attainment:

a. Substantive, organisational entity with clearly specified and devolved accountability for leadership and management of engineering VET programs

b. Long term, RTO commitment and strategic management to assure the development of the engineering discipline and the provision of appropriate resources

c. Formally constituted governance and committee structures with clearly defined policies, procedures, processes and mechanisms for program selection, approval, review and improvement

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There must be an identifiable organisational entity responsible for the engineering VET function within the RTO awarding the qualification. Most commonly this will take the form of a named department, division, faculty or school that has a key focus on and responsibility for the overall leadership, management and operation of the engineering VET function. In documents comprising the Accreditation Management System, the organisational entity responsible for the engineering VET function is referred to as the *engineering school*. Other forms of organisation may be acceptable but it is unlikely, for example, that an engineering VET 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 is expected that the engineering school has leadership responsibility – subject to the approval processes of the host RTO – for: the selection, packaging, implementation and delivery of the specified units of competency as well as the program learning and assessment design; support and management of the engineering VET competency programs; for the management of associated resources; and for the appointment and management of the teaching and support staff (see CE2, CE3, CE4). If this is not the case, then the RTO will need to demonstrate how sufficient engineering expertise is provided to make critical decisions in these areas.

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

There must be evidence that the host RTO regards engineering VET as a significant and long-term component of its strategic activity, and has adequate arrangements in place for planning, development, implementation, delivery, and the continuous quality improvement of engineering VET programs, and for supporting the associated professional activities of staff. This would most commonly be evident from the RTO's internal governance, management and committee structures, and its overall mission statement and strategic plans. In addition, the engineering school's organisation, approved mission, strategic and operational plans, initiatives, submissions, responses to corporate requests, and evaluated performance should

give expression to the RTO's capabilities and commitment to offering engineering VET programs.

There must be in place formal committee structures and mechanisms for the ongoing review and improvement of engineering VET competency programs and for formal approval of new program proposals and program amendments.

4.2 CE2 Teaching and support staff profile

Purpose: To demonstrate how the staff profile and supporting practices enable the delivery of the program

Suggested evidence of attainment:

a. Adequate program teaching staff numbers, with:
  i. Appropriate depth mix and distribution of qualifications, experience and engineering practice exposure, scholarship and professional standing to match the range of specialist program offerings
  ii. Gender balance across the teaching appointment levels
  iii. Appropriate learner/staff ratios

b. Effective use of sessional and industry presenters to enrich staff skills profile and the exposure of learners to engineering practice

c. Effective teaching workload policies and practices

d. Effective learner support structures, systems and staffing

e. Appropriate technical and administrative support staff

f. Adequate learner counselling and advisory services

The RTO must have in place adequate policies and mechanisms in place for attracting, appointing, retaining and rewarding sufficient well-qualified staff and providing for their ongoing professional development. The RTO must ensure that creative leadership is available to the engineering school through the appointment of highly-qualified and experienced senior staff in sufficient numbers.

The teaching staff must be sufficient in number and capability to assure the quality of the delivery of the engineering program and the attainment by learners of the program's stated vocational outcomes. As a guide, a viable engineering school would be expected to have a minimum of eight (8) full-time-equivalent teaching staff employed on a continuing basis, with reasonable gender balance across the teaching staff appointment levels, and not less than three (3) full-time equivalent staff with specialist engineering knowledge and experience in any field in which a designated qualification or major is offered. Where a program has little or no overlap with other programs offered, more than three (3) specialist staff members are likely to be necessary. In no case should a major program be dependent for its delivery on a single individual.

There should be an appropriate balance of staff appointments across the VET teaching levels in order to provide appropriate teaching leadership and at the same time providing the experience profile, the teaching expertise and learner support appropriate to the program. EA strongly encourages policies and practices to achieve gender balance amongst the engineering

teaching staff.

The Accreditation Board will look for evidence that staff numbers and teaching loads relative to learner numbers are such as to permit adequate teacher interaction with learners and support for the range of learning activities and assessment tasks offered. Staff should also have adequate opportunity for professional engagement outside of their teaching responsibilities. Arrangements by the RTO for workload management, capacity and succession planning should support these objectives.

As well as the full-time teaching staff team, engineering schools are strongly encouraged to draw on the expertise of practising professionals in engineering and related fields for guest teaching and contracted sessional delivery. There must be adequate arrangements for the initial training, supervision and guidance of both regular and sessional staff.

It is considered important that the teaching staff should come from a diverse range of backgrounds, embodying a mix of VET teaching experience and engineering industry-based experiences, which could include exposure to national and international engineering work experiences.

In gauging the capabilities of the engineering school, the Accreditation Board will look at the teaching staff members' qualifications in engineering, VET and in education, as well as engineering practice activities, teaching experience, and contributions to the advancement of engineering learning and practice. Involvement by staff in professional societies; chartered status and/or registration on the National Engineering Register and effective participation in on-going professional development are also important relevant indicators which will be considered.

It is recognised that VET competency programs can be delivered in a variety of learning and assessment modes with learners supported to undertake learning activities at locations other than at the 'host' RTO campus through workplace learning programs, on line distance delivery. RTOs may form partnerships with both traditional and non-traditional providers to facilitate the delivery of engineering VET competency programs. However, the RTOs awarding the qualification will be considered responsible for assuring the capabilities of all staff involved, and the Accreditation Board will require evidence of how this is achieved.

There must be sufficient qualified and experienced members of technical and administrative staff to provide adequate support to the delivery and assessment of the engineering VET competency program. It is recognised that some of these staff may be located (physically and/or organisationally) outside the engineering school itself.

The engineering school and/or the RTO must have sufficient staff and facilities to provide adequate levels of learner counselling, learning support, and interaction with relevant stakeholders such as employers, graduates and alumni and the broader community.

4.3 CE3 Teaching leadership and learning culture

Purpose: To demonstrate the key leadership features that drive program delivery

Suggested evidence of attainment:

a. Effective program teaching teams, with motivated team leadership, to drive the learning and assessment design, implementation and improvement processes.
b. Cohesive program teaching team inclusive of all teaching and relevant support staff.
c. Dynamic, cooperative learning community, inclusive of gender, culture, social differences; and engaged with:
  i. Progressive pedagogical frameworks and the adoption of best practice in engineering vocational education and training.
  ii. Cooperative industry and community outreach programs and initiatives.
  iii. Encouraging diversity and the development of individual staff as learning facilitators.
d. Staff role modelling Engineers Australia Stage 1 Competency Standard for Engineering Associate.
e. Appropriate policies and record of staff development – in both pedagogical and professional practice skills.
f. Staff awareness of gender and cross-cultural issues, inclusive of a cohesive teaching team approach.

For each program, there should be a clearly identified teaching team and teaching leader. Role descriptions, terms of reference, accountabilities and reporting obligations for the program teaching team leaders and program teaching team(s) should be clearly defined and understood by all stakeholders.

There should be significant, ongoing involvement of all teaching and relevant support staff in the processes of program learning and assessment design matched to the specified units of competency for the program, as well as in the program delivery and assessment review and continuous quality improvement processes. A holistic approach is expected and requires for a particular program, the full involvement of all teaching and support staff to work together as a cohesive teaching team: this should be evident to the learners.

The program teaching team would be expected to meet regularly to consider input and feedback from the full range of stakeholders, and use this information in the design, implementation and ongoing continuous quality improvement of the program. The program teaching team should monitor, using declared performance criteria, the attainment by learners of the units of competency and vocational outcomes specified for the program as a whole.

The Accreditation Board will look for evidence of a cohesive, dynamic, inclusive, innovative and outward-looking intellectual climate in the engineering school. In particular, there should be awareness amongst teaching staff of current VET regulation, thinking, practice and development, and a proactive attitude to engaging with progressive pedagogical frameworks for learning facilitation, and the adoption of best practice in the implementation, delivery and assessment of engineering VET programs.

Engineering school policies and practices should clearly demonstrate that teaching staff have active and productive links with industry and the community through which they can enrich the learners' experience. The engineering school's community outreach and professional activities should include proactive interactions with the secondary school sector.

Staff appointments, staff development and management processes, and codes of practice in the school and the RTO should enable staff to develop both as engineering professional

practitioners and as VET professionals, recognising cultural, gender and equity needs and reflecting an inclusive operating environment.

Whilst many teaching staff will have a professional engineer or engineering technologist qualification, they should also actively role-model the capabilities defined in the Engineers Australia Stage 1 Competency Standard for Engineering Associate and should be continually aware of their responsibility to do so.

The engineering school should ensure an appropriate range of professional development opportunities are made available to teaching staff and that systems are in place to monitor the extent and impacts of staff participation in such development activities. Staff development programs for engineering VET teachers should aim at developing their pedagogical capabilities in VET learning, delivery and assessment design, program implementation and the use of new and emerging delivery methodologies and in the development of learning and assessment quality management systems as well as advance their professional standing within the specific engineering discipline.

4.4 CE4 Funding, facilities and physical resources

Purpose: To ensure that resources appropriate for the delivery and assessment of a para-professional engineering VET program are available throughout the accreditation period.

Suggested evidence of attainment:

- **a.** Sound business planning for current commitments and future developments
- **b.** Appropriate principles for distributing funding to support the competency program
- **c.** Ongoing viability - capacity to deliver current commitments and projected developments
- **d.** Appropriate experimental and project-based learning facilities to support both structured and investigatory learning within the designated engineering discipline
- **e.** Adequate IT facilities and support
- **f.** Access to simulation, visualisation, analysis, design, documentation, planning, communication and management tools as well as test and measurement equipment and information resources appropriate to current industry practice
- **g.** Learning support facilities appropriate to the development and achievement of the intended vocational outcomes of the program and matching the needs of individual learners, including those with a disability

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The RTO must have in place adequate policies and mechanisms in place for the appropriate funding its engineering school. The RTO's strategic planning cycle and funding distribution model must be sufficient to adequately support the ongoing delivery of the current engineering VET competency programs. Funding sources include government grant funds, fee income, and direct income earned through industry and entrepreneurial activity.

Resources provided to the engineering school are usually most dependent on learner numbers. A criterion for viability is therefore a continuing level of demand for admission from appropriately qualified candidates in sufficient numbers to maintain the program. On-going viability should be monitored through rigorous demand analysis. Strategic decisions on

program offerings should be taken systematically and on an appropriate time scale.

For all programs and associated implementation pathways, there must be adequate facilities for learner-staff interaction. For both on-campus and external off campus learners alike there must be adequate classrooms, learning-support facilities, study areas, library and information resources, computing and information-technology systems, and general infrastructure to fully support the achievement by learners of the targeted vocational outcomes of each specific program. For distance, off campus, remote campus or offshore implementations there must be communication facilities sufficient to provide learners with learning activities and support that are equivalent to on-campus attendance.

Appropriate experimental and project-based learning facilities must be available for learners to gain substantial experience in understanding and operating engineering equipment, designing and conducting experiments and undertaking engineering project work. The equipment must be reasonably representative of modern engineering practice and facilitate sound learning design. Facilities need to support structured laboratory activities, experiments of an investigatory nature and more open-ended project-based learning.

Access to modern analysis, synthesis, design, visualisation, computer simulation tools, documentation, planning, communication and management tools as well as test and measuring tools in the engineering, sciences, and business domains of engineering practice is expected to be provided.

Where practical work is undertaken remote from the host RTO campus, such as at another RTO, other educational institutions or in an industry environment, the arrangements must be such as to provide appropriate access to facilities, supervision and equipment and to assure the equivalence of the vocational outcomes of the program.

Access to facilities and equipment must support the development by learners, including those with a disability, of the full range of vocational outcomes defined for a specific program.

4.5 CE5 Learner administration and strategic management of the learner profile

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Purpose: To ensure the learner learning baseline is managed and verifiable at the individual and cohort levels

Suggested evidence of attainment:

a. Appropriate policies and robust systems for:
- **i.** Learner records data management
- **ii.** Defining and maintaining learner admission standards
- **iii.** Analysis, assessment and verification of prior learning and prior experience for awarding advanced standing; individual learner progress monitoring, performance warning and exclusion
- **iv.** Determining qualification eligibility, commensurate with the attainment of the specified units of competency
- **v.** Learner advice
- **vi.** Monitoring success, retention and graduation rates
- **vii.** Monitoring enrolment trends and program viability

There should be policies, procedures and systems in place providing the RTO and the engineering school with reliable and timely access to learner records and data sets that provide the basis for evidence-based evaluations of program performance and viability, and learner performance as well as progress within the program of particular learner cohorts and individuals.

There must be an admissions system that ensures an acceptable standard of entry for learners from appropriate learning or vocational backgrounds. The RTO must publish the requirements for admission, including equivalent requirements by learners from alternative pathways.

Admission policies and processes must be consistent with the published requirements, and include, as necessary, assessment of formal and informal prior learning. Where advanced standing is offered, there must be clearly defined and rigorous processes for the assessment and verification of prior learning (see also CP3).

The RTO must have formal policies and processes in place for tracking individual learner progress, issuing advice on progress, and provision of timely warnings to learners at risk and systematic remediation. There must also be policies and processes for learner exclusion and appeal.

There must be a formal process for determining learners' eligibility to graduate, commensurate with their attainment of the specified units of competency for the program.

There should be appropriate systems, formal policies and processes requiring monitoring and reporting on learner demand, enrolments, retention, unit completions, and graduation rates for a specific program and particular learner cohorts within that program. Monitoring of such cohort and program performance measures is expected to help inform program development, review and continuous quality improvement processes. The engineering school should be able to demonstrate a reasonable relationship between admission standards and learner retention and graduation rates.

The records management system must enable auditing of the above processes at any time and provide confirmation of system integrity.

5. Quality Systems

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

5.1 CQ1 Engagement with external stakeholders

Purpose: To ensure input from downstream stakeholders drives continuous quality improvement of the program

Suggested evidence of attainment:

a. Ongoing, regular input to the establishment, review and attainment monitoring of the specified units of competency from a formal advisory body that typically includes representation from alumni, learners, industry, the community and professional organisations as well as the engineering profession

b. External stakeholders facilitating appropriate professional practice exposure opportunities for learners

c. Productive industry linkages arising from collaborative project activities and contributing to the professional development of staff and learners

d. Provision of graduate, alumni, employer, industry, program advisory body and community input mechanisms

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To ensure that Australia has a globally competitive economy, it must have an innovative, flexible and responsive education and training system which is aligned with the needs of many stakeholders which includes RTOs, learners, external industry stakeholders from the various engineering sectors as well as the broader community. Valid preparation of learners for engineering practice in the occupational category of Engineering Associate requires interaction with the engineering industry and the broader community on an ongoing basis.

The charter of the Australian VET sector, which includes engineering schools, is to actively respond to and support the skill development needs of engineering organisations from the public and private sectors. The EA Accreditation Policy (Reference [6]) also requires that education and training providers respond to industry needs. For their responses to be effective, however, industry must in return make a serious commitment to the development of the partnership as well. Some public and private sector corporations are exemplary in this regard; however, many more are needed for the relationship to be fully effective.

External stakeholder feedback and input should provide an important contribution for monitoring the delivery and assessment of the program and the attainment of specified units of competency for the program as well as informing the continuous quality improvement processes.

A specific requirement of the Accreditation Policy is for a formally-constituted program advisory mechanism or mechanisms, involving key stakeholders especially from industry and the broader community. The engineering school must secure the active participation of practising engineers, graduates, alumni, professional bodies and leading employers of engineering graduates in defining, updating and evaluating the learning and assessment

requirements against the specified units of competency for each program.

At least some members of the advisory body should ideally be at senior level in industry. In order for such involvement to be effective, the interactions must be well structured and well managed. The engineering school must present real issues for debate and must be seen to be responsive to feedback and comments provided by industry stakeholders. Consultative dialogue should be bilateral or multilateral, involving active contributions and making use of the expertise of all stakeholder groups including learners.

A senior industry advisory body would be expected to operate mainly at the strategic level in monitoring and analysing industry needs and trends as well as the review and performance monitoring of the program's vocational outcomes objectives and graduate completions. The advisory body should have input to establishing performance standards and strategies for monitoring the development of technical competence, engineering application skills and personal and professional skills for each program.

Depending upon organisational structures, there may be a case for a two-tiered approach, to provide both strategic direction and advice as well as specific input to the learning and assessment design, review and performance monitoring at the individual program level. In some instances, this may be achieved by a single advisory body with individual members or sub-groups accepting engagement to provide advice and assistance in the learning and assessment design at a more detailed, operational level. Suitably qualified individuals may also be invited to serve as adjunct staff or assessors of learner performance.

An effective and productive industry engagement is also crucial for providing learners with the necessary range of exposure to engineering practice, providing opportunities for collaborative project work, potential opportunities for employment after graduation as well as providing professional development opportunities for the program teaching staff.

There must be formal processes for securing specific and systematic feedback from key stakeholders such as the advisory boards, graduates, alumni, employers of engineers and representatives from the broader community. There should be evidence of the systematic application of feedback in conjunction with other quantitative measures to setting, monitoring and reviewing outcomes at the level of each unit of competency, as well as at the level of overall overall program.

5.2 CQ2 Engagement with learners

Purpose: To ensure learner feedback informs the continuous quality improvement of the program

Suggested evidence of attainment:

a. Use of staff-learner consultation forums, focus groups and other direct input mechanisms for on-going review, evaluation and continuous program improvement

b. Appropriate use of survey instruments and other methods for obtaining systematic learner feedback

c. Learners seen as true partners in a culture of continuous quality improvement

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One on one staff-learner discussions, staff learner consultation forums, focus groups, use of survey instruments and commissioned submissions can facilitate productive involvement as well as providing direct learning activities for learners in the processes of continuous quality improvement.

The use of appropriate survey instruments for collecting learner feedback on aspects of their learning and assessment activities including evaluations of teaching and the delivery of the units of competency, learner activities and assessment tasks, and graduate employment rates and destinations are recommended. Systematic review of relevant VET data obtained from national, institutional, and local learner surveys should be used to help to inform revisions of the specified units of competency and the program as a whole.

Learning and assessment design review and continuous quality improvement processes must involve regular interaction with and on-going input and feedback from the learners. Direct involvement of the learner body as partners in the processes of continuous quality improvement is strongly encouraged. There should be evidence of the systematic application of learner feedback in conjunction with other quantitative measures for setting, monitoring and the review of the delivery and assessment of the specified units of competency for the specific program.

5.3 CQ3 Continuous quality improvement of the VET competency program

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Purpose: To embed continuous quality improvement as a normal program improvement activity

Suggested evidence of attainment:

a. Continuous improvement processes involving all teaching and support staff, learners and external stakeholders

b. Holistic approach driven by a clear understanding of the 'big-picture' at an individual program level

c. Documented records and dissemination of improvement actions and processes to facilitate continuous quality improvement

d. Closing the loop within the units of competency via elements, performance criteria, performance evidence, knowledge evidence and assessment conditions

e. Closing the loop on delivery of the specified units of competency, matching the actual vocational outcomes with the intended vocational outcomes

f. Documented processes for:

- **i.** New program approval - including demand analysis, establishing rationale, selection of the specified units of competency, learning and assessment design
- **ii.** Program amendment

g. Compliance with the mandatory requirements of the national VET Quality Framework or the state VET regulatory authority equivalent must be demonstrated

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Systematic regular, ongoing reviews and continuous quality improvement processes should be inclusive of all staff engaged in the delivery and assessment of the program and involve the on-going input from key external stakeholders (refer CQ1) as well as feedback and input from the learners (refer CQ2). Performance assessment at every level should involve a variety of

measures as well as input from an appropriate range of external stakeholders to help drive the continuous improvement cycle.

As part of a holistic big picture approach, there must be formal, documented processes for setting, reviewing and revising the delivery and assessment of the units of competency and vocational outcomes specified for each program.

These processes should ensure that the intended vocational outcomes specification remains aligned with the EA Stage 1 Competency Standard for Engineering Associate, as well as external practices and specific industry needs appropriate to the designated field of practice and/or specialisation(s).

At the level of the unit of competency, the review and improvement processes should include regular monitoring and revision of the learning activities as well as the diagnostic, formative and summative assessment tasks thereby validating the delivery and attainment by the learner of the units of competency of the specific program. Closing the loop on the elements, learning activities, performance criteria and assessment tasks at the level of the unit of competency should be a prime objective of this process.

There should also be a documented system for setting, reviewing and monitoring the delivery and assessment of units of competency associated with professional practice exposure.

At the program level, the aggregation of the learning activities and assessment tasks which are drawn from the individual units of competency along with a range of inputs, feedback and performance measures gleaned from the full range of stakeholder inputs should come together to provide multi-dimensional data appropriate for evaluating the overall performance of the program against the intended vocational outcomes of the program. Substantiating delivery of the vocational outcomes in this way will help to close the loop by validating the satisfactory attainment by the learner of the specified units of competency and the underlying EA Stage 1 Competency Standard for Engineering Associate, thus ensuring that the generic attributes specified in the Accreditation Policy are developed to a sufficient level by all graduates.

There must also be in place formal documented processes and records for formal approval of program amendments and new program proposals. There must be formal approval processes associated with program learning, delivery and assessment planning, implementation and amendment, with due reference to demand analysis, the input of teaching staff, learners and external stakeholders, to help drive the quality improvement processes.

Compliance with the ***mandatory*** requirements of the national VET Quality Framework or the state VET regulatory authority equivalent must be demonstrated – through the provision of either of the following:

i. A verified copy of the most recent external audit of compliance by the VET Regulator against the relevant VET quality standards; or

ii. If a recent external VET quality audit report as in (i) above is not available, then compliance must be verified in writing by the RTO's Quality Manager or their

organisational equivalent

5.4 CQ4 Dissemination of learning and assessment expectations to learners and stakeholders

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Purpose: To provide the professional context of the program to learners and stakeholders

Suggested evidence of attainment:

a. Providing an adequate overview of the intended vocational outcomes of the program and the justified selection of the specified units of competency

b. Program guideline documents, including learning, delivery and assessment plans, which clearly reflect the program learning and assessment strategies and which map the aggregation of learning strategies and assessment tasks to assure the development and attainment of the specified units of competency

c. Adequate documentation for each of the specified units of competency, demonstrating the mapped linkages between the elements, performance criteria, underpinning knowledge, learning activities and assessment tasks

d. Adequate identification of the learning and assessment resources needed to support the delivery and assessment of the program

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Learners and stakeholders should be provided with a statement of the intended vocational outcomes of the program, which should align with and help justify the selection of the specified units of competency for the program. These outcomes should, in turn, be linked to the EA Stage 1 National Competency Standard for Engineering Associate.

The learning and assessment design process should be documented and made available in an appropriate format to each learner and the various stakeholders involved in the program. For a specific program, this would include the guideline documents including the program title, the national qualification code number of the program, a statement of purpose, a statement of the requirements to complete the program, a summary of the specified units of competency, the assessment guidelines, and the learning and assessment plan.

The learning and assessment plan should demonstrate, via a mapping process (see CP3), how the delivery of the intended vocational outcomes occurs through the aggregation of the specified units of competency: the individual learning activities linked to the unit elements and the assessment tasks linked to the unit performance criteria that are distributed across the program. The learning and assessment plan should clearly demonstrate for each unit of competency, the linkages between the elements, learning activities, performance criteria, and assessment tasks.

Dissemination of this holistic view of the learning and assessment design at the program level would normally be available to learners and stakeholders via the RTO's website or through published documentation provided in the nationally endorsed training package qualification or VET accredited course, the specified units of competency, the learning and assessment guidelines as well as the implementation documentation developed by the RTO at the program and unit of competency levels (see also CP5c).

Systematic documentation of the learning and assessment design is crucial to map and manage flexible pathways that could provide an alternatively pathway for attaining the specified units of competency for the program.

5.5 CQ5 Benchmarking

Purpose: To facilitate strategic ongoing continuous quality improvements to the program

Suggested evidence of attainment:

a. Regular implementation of appropriate processes for ensuring that the intended vocational outcomes and specified units of competency for the program are aligned with:
- **i.** the expectations of learners, key employers and other external stakeholders
- **ii.** current national and international learning theory and assessment practices
- **iii.** comparable program implementations in other RTOs, both locally and nationally
- **iv.** the application of appropriate ASQA, AVETMISS, DET, NCVER and other relevant VET performance data to help drive continuous quality improvements to the program

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Engineering schools should engage in some form of regular comparative analysis to ensure the attainment of the specified units of competency for the full range of vocational outcomes for a competency program are comparable with national practice, and where possible international practice. Comparative analysis could be based on exchanges of teaching staff, learning and assessment materials, discussion forums with key stakeholders and between the program leadership and teaching staffs, visit teams to other RTOs and/or the use of external VET experts and assessors. In addition, comparative analysis could also include reference to the appropriate ASQA, AISC, AVETMISS, DET and NCVER statistics as well as reference to information or data available from the appropriate Industry Reference Committees.

Beyond this, more systematic benchmarking should be undertaken to assist with identifying best practices in engineering VET program implementation, learning, delivery and assessment and specific directions for overall unit of competency and program improvement. While the EA accreditation process will evaluate program standards, engineering schools within RTOs should engage in regular benchmarking practices to ensure that the requirements of the national training package qualification or VET accredited course are being met. This will help to drive continuous quality improvement, beyond what the accreditation system can support.

Context of this Document in the AMS

This document, AMS-MAN-20 Accreditation Criteria User Guide – VET, is located within the hierarchy of the Accreditation Management System as depicted in the table below.

POLICY	*Statement of accreditation principles*	
	AMS-POL-01	**Accreditation Policy**

STANDARDS	*Standards against which compliance is evaluated*	
	EA Stage 1	**Competency Standards (**see Engineers Australia website)
	AMS-STD-10	Accreditation Standard – Higher Education
	AMS-STD-20	**Accreditation Standard – VET**

MANUALS	*Instructions for accreditation*	
	AMS-MAN-10	Accreditation Criteria User Guide – Higher Education
	AMS-MAN-11	Procedures Manual – Higher Education
This document	**AMS-MAN-20**	**Accreditation Criteria User Guide – VET**
	AMS-MAN-21	**Procedures Manual – VET**

HANDBOOK	*Contextual information on professional practice*	
	AMS-HBK-01	**Engineering Handbook** (not yet available)

TEMPLATES	*Documents with specified format and structure*	
	Various	Not listed here

PRACTICE NOTES	*Information about, and examples of, good accreditation practice*	
	Various	Not listed here (none available yet)

Revision History of this Document

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Date	**Version**	**Description**	**Approved**
07 August 2018	0.1	First release	R Watts