ENGINEERS AUSTRALIA
Australian Engineering Accreditation Centre

REPORT TO
AUSTRALIAN COUNCIL OF ENGINEERING DEANS
9 April 2010

Alan B Bradley – Associate Director, Accreditation

1 NEW DIRECTOR – EDUCATION AND ASSESSMENT

Within the Engineers Australia organisational structure the Accreditation Centre is part of the Education and Assessment Directorate. Following the retirement of Dr Maurice Allen at the end of February, 2010, Dr David Robinson has been appointed as the new Director of Education and Assessment.

David has worked as a Director in public service and private sector water and environmental engineering roles, as well as in private sector consultancy. He has also had 11 years of experience as an engineering academic, including experience in the USA. He has had a long involvement as a Member and Fellow of Engineers Australia serving in various capacities in the water engineering field, and in addition, for the past two years was appointed to the National Office staff as Manager, Membership Assessment.

David holds a PhD from UNSW.

2 THE ACCREDITATION TEAM

Engineers Australia fulfils the role of national accreditation authority for engineering education programs through its Australian Engineering Accreditation Centre in Melbourne.

The Accreditation team comprises:

- Associate Director – Emeritus Professor Alan Bradley (0.6 full time),
- Accreditation Manager - Dr Peter Hoffmann (full time),
- Accreditation Officer - Ms Jill Kiley (0.8 full time time).

To add diversification of expertise to the accreditation function, the Board has endorsed four Accreditation Visit Managers who are individually contracted to support the Associate Director Accreditation on particular accreditation visits. The Accreditation Visit Managers are:

- Emeritus Professor Neil Page FIEAust CPEng,
- Emeritus Professor Vic Gosbell FIEAust CPEng,
- Dr Jeff Stewart FIEAust CPEng,
- Emeritus Professor Mike Brisk FIEAust CPEng.

An annual Workshop was again held for Accreditation Visit Managers on 20 January, 2010 to review operating protocols, accreditation procedures and document standards. The Visit Managers were invited the following day to observe the Accreditation Consultative Committee meeting, and following this each Visit Manager made individual reports to the Accreditation Board meeting on the afternoon of 21 January.

As part of the overall QA process, the Associate Director Accreditation and/or the Manager Accreditation maintain a direct involvement in all accreditation visits – and participate as a non-visiting consultant(s) with direct input to the pre-visit teleconference and on-site decision making forum whenever an external Visit Manager is deployed.

3 MEMBERSHIP - ACCREDITATION BOARD

The Board comprises the National Vice-President (Education and Assessment), the Director Education and Assessment, the Associate Director Accreditation, and five members appointed by Council. Incumbents for 2010 – as follows:

Emeritus Professor Robin King FIEAust CPEng FIET, (Chair);
Professor Alex Baitch FIEAust CPEng, National Vice President (Education and Assessment)
Ms Shireane McKinnie FIEAust CPEng, Head, Acquisition and Sustainment Reform Division, Department of Defence;
Mr Richard Bevan FIEAust CPEng, Chief Executive Officer, Transend Networks Pty Ltd;
Mr Neville Power FIEAust CPEng, Chief Executive Australian Operations, Thiess Pty Ltd;
Dr John Yeaman FTSE FIEAust CPEng, Chairman, Pavement Management Services;
Dr Maurice Allen FIEAust CPEng, Director Education and Assessment;
Emeritus Professor Alan Bradley FIEAust CPEng, Associate Director Accreditation;
Secretary to the Board: Ms Jill Kiley, Accreditation Officer.

The work of the Board is supported by the Accreditation Consultative Committee, a joint committee of Engineers Australia, the Australian Council of Engineering Deans (ACED) and the Australian Association of Engineering Education (AAEE).

Accreditation Board meetings scheduled for 2010 are:

- 21 January (joint meeting with Accreditation Consultative Committee),
- 13 May
- 21 September,
- 1 December.

4 ACCREDITATION ACTIVITY 2009

Accreditation panels appointed by the Board undertook full general review on-site visits to engineering schools at each of the following universities during calendar year 2009:

- The University of Melbourne;
- LaTrobe University (Bundoora and Bendigo);
- The University of Sydney (Washington Accord);
- RMIT (Washington Accord);
- RMIT (Singapore and Hong Kong);
- Flinders University;
- University of Southern Queensland;
- Murdoch University.

Appointed accreditation panels visited the following universities to consider new program offerings and programs for transition from provisional to full accreditation:

- Ballarat University – transition to full accreditation;
- Charles Darwin University – transition to full accreditation;
- University of New England – new BE programs;
- The University of Adelaide – new BE programs;
- Deakin University - new BE programs;
- Queensland University of Technology - transition to full accreditation;
- Southbank Institute of Technology - new Associate Degree programs;
- Curtin University (desktop review) - new BE program;
- Edith Cowan University - new BE programs and transition to full accreditation;
- Monash University - transition to full accreditation;
- The University of Queensland - new BE programs and transition to full accreditation.

5 2009 ACCREDITATION BOARD OUTCOMES

The Accreditation Board met on three occasions during 2009 with the following outcomes.

5.1 Recommendations on accreditation – endorsed by the Accreditation Board

The accreditation outcome recommendations for the 170 programs considered during processing of 20 accreditation visit reports by the Board in 2009 are summarized in the table below. For each occupational level the entries indicate the number of programs recommended for each accreditation decision category. Only single degree program outcomes are counted. Combined/dual/double degrees are simply combinations of the host engineering degrees already counted in the table.

Accreditation outcome recommendations	Number of programs within each occupational category		
	Professional Engineer	Engineering Technologist	Engineering Officer
Continuing/Full Accreditation 5 years	**52**	**0**	**0**
Continuing/Full Accreditation Limited Term	**0**	**6**	**0**
Provisional Accreditation	**33**	**8**	**0**
Provisional Accreditation Limited Term	**4**	**0**	**7**
Accreditation decision deferred pending further development	**38**	**4**	**1**
Accreditation declined	**0**	**0**	**0**
Accreditation terminated on request of the provider	**17**	**0**	**0**

5.2 Interim reporting requirement

For 10 of the 20 accreditation visit reports conducted in 2009, the Board required universities/institutions to submit an interim (mid-term) report on action taken against recommendations brought forward by visiting panels.

5.3 Recommendations for ongoing improvement

Each accreditation visit panel provides recommendations to the Faculty/School for program improvement. These recommendations are always specific to the operating environment, curriculum design and quality systems within the particular university/institution and are derived from the panel's findings, following the detailed review of programs against each element of the accreditation criteria. Some recommendations will be of a generic nature and others specific to individual programs. These recommendations provide a key reference for the next scheduled review by Engineers Australia, and universities/institutions are expected to document actions and progress against these recommendations as part of the subsequent submission documentation.

Although there is much diversity in these recommendations, an analysis does reveal some recurring issues of concern expressed by the panels. The table below lists the frequency of occurrence of some of these common themes identified in the formal recommendations of evaluation panels across the 20 accreditation visits conducted in 2009.

Identified need to:	Number of visit reports where this need was explicitly raised by the assessment panel
Strengthen industry input and advice in setting, reviewing and monitoring the methods for tracking attainment of designated graduate outcomes	14
Implement a holistic, 'big-picture' approach to setting the graduate outcomes specification for each program	6
Build a systematic, educational design and review approach which maps delivery of graduate outcomes through the contributions of learning outcomes and assessment measures in individual academic units	10
Improve structural balance between program, core and elective components, more systematic approach to elective packaging through minor sequences or better definition, course re-use issues, depth of specialist technical outcomes	9
Compatibility of program title with structure and content	2
Address program structural integrity to ensure consistency of outcomes as students choose alternate implementation pathways	1
Integrity and equivalence of engineering outcomes for double/combined degree implementations	4
Strengthen engineering application skills development – design; projects; open ended problem solving, practical and laboratory learning	4
Strengthen focus on engineering practice in the first year specifically through broad context project activity	1
Strengthen technical content - specific programs	6
Issues with standard/supervision/management/execution/moderation processes for capstone project	5
Systematic approach to industry internships/placements, rigour in tracking learning outcomes	6
Strengthen focus on team based activities and skills for working in and leading teams	2
Compliance with requirements ACS/EA Guidelines on Software Engineering programs	1
Compliance with Environmental College guidelines on Environmental Engineering programs	1
Compliance with EA guidelines – distance delivery model	2
Issues with mathematics and/or science teaching standards	2
Strengthen exposure to engineering practice as an integral component of learning	3

Identified need to:	Number of visit reports where this need was explicitly raised by the assessment panel
Strengthen integrated development of business, enterprise and project management knowledge and capabilities	3
Offshore program implementation – equivalence of learning experiences and educational outcomes, local contextualisation	3
Differentiation of outcomes – Technologist Vs Associate Vs Prof Engineer programs	1
Conversion masters – entry pathways and outcome standards – differentiation from BEng standards, course re-use issues	2
Increase use of reflective practices – student self evaluation of personal and professional development against targeted graduate outcomes, building accountability for self learning and assessment , implementation approach to e-portfolio	7
Strengthen development of generic professional competencies - including awareness and commitment to sustainability, professional ethics, risk management, exposure to codes and standards	6
Strengthen dissemination of educational design philosophy, 'big-picture' graduate outcomes mapping and program structure for student stakeholders, particularly through academic unit learning guides and other means	9
Strengthen leadership of program teaching teams	8
Staff development needs	2
Accountability of program teaching team for setting, reviewing and tracking attainment of targeted graduate outcomes, for systematic educational design, and for management of quality systems including stakeholder engagement	5
Offshore implementation – coordination and linkages between offshore and home campus teaching teams	1
Faculty/School structural/organizational/coordination/communication issues	2
Coordination and quality assurance of third party teaching provision - franchised delivery, branch campus activity, contracted delivery	1
Address academic staff profile deficiencies, succession planning	9
Strengthen involvement of practising industry professionals in sessional and/or guest teaching roles	7
Address inadequacy of provision - practical/laboratory./project based learning facilities	7
Address issues with general learning environment – flexibility and adaptability to learning needs, collaborative learning support	1

Identified need to:	Number of visit reports where this need was explicitly raised by the assessment panel
Address issues technical support staff profile/capability	2
Strengthen systematic closure of the quality loop at both academic unit and program levels including tracking of delivery and assessment of graduate outcomes	3
Strengthen benchmarking practices at national/international levels - moderation of assessment standards	6
Address Honours determination algorithm/distribution statistics	2
Address advanced standing policy/provisions/analysis methodology/documentation	1
Strengthen engagement of students as stakeholders in the processes of continuing quality improvement – tracking delivery and assessment of targeted graduate outcomes	8

6 2009 ACCREDITATION PANELS

The work of the Accreditation Centre is only possible with the support of volunteer panel members comprising both senior engineering academics and industry representatives. The evaluation panel role involves a 2½ day commitment for the on-site visit, often involving interstate, or on occasions overseas travel, as well as prior preparation and post visit follow up activity.

The Board gratefully acknowledges the involvement of 29 industry engineers and 26 senior engineering academics who served as panel members and panel Chairs during 2009.

7 INTERNATIONAL ENGINEERING ALLIANCE MEETINGS – Kyoto, Japan 2009

In recent years Engineers Australia has become more influential in the affairs of the international engineering accords and mobility forums through various roles, serving as Chair of the Washington Accord, Deputy Chair of the Sydney Accord and the APEC Secretariat, chairing commissioned working parties as well as international review and monitoring panels, chairing the Selection and Monitoring Committee for the appointment of the professional Secretariat, and leading international mentoring teams to assist new jurisdictions working towards signatory status.

In June of 2009, a delegation of four team members including the Chair of the Accreditation Board, the Director Education and Assessment and the Associate Director Accreditation represented Engineers Australia at the International Engineering Alliance Meetings held in Kyoto, Japan.

These meetings included common forums for both mobility and educational accords as well as separate open and closed business meetings for Washington, Sydney and Dublin Accords, as well as the Engineers Mobility Forum, The Engineering Technologists Mobility Forum and the APEC Register Coordination Committee.

Major outcomes of consequence to the Engineers Australia accreditation function were:

- Adoption of version 2 Graduate Profile and Professional Competencies Exemplar document, see ***Attachment 1***, which provide a guideline for developing target competency standards within individual signatory jurisdictions. Version 2 is the culmination of an extended working group effort that included Engineers Australia and which addressed the changing academic standards that are emerging in Europe as the Master of Engineering becomes the base qualification for entry to professional engineering practice. This version 2 document has been a valuable resource as we finalise revision of the Engineers Australia Stage 1 Competency Standard in 2010.

- Adoption of IEA Code of Conduct guideline.
- Adoption of changes to Accord Rules and Procedures to accommodate accreditation processes for dealing with asynchronous/flexible delivery modes and external/distance education options as proposed by Engineers Australia.
- The Chair of the Accreditation Board was elected Deputy Chair of the Sydney Accord for a further 2-year term.

New Working Groups were commissioned as follows:

- Improved guidelines for periodic review of Accord signatory accreditation systems.
- Setting documentation standards for website listings of accredited programs. (Engineers Australia to Chair)
- Harmonisation of Accord requirements with EURACE/ENAEE developments.

As an outcome of the meetings, ABET – USA will be promoted to full signatory status under the Sydney Accord and the Board of Engineers, Malaysia was promoted to full signatory status under the Washington Accord.

Closed session debate occurred regarding the review of ASIIN Germany for promotion to Full Signatory status. Issue of concern is Germany's insistence that first cycle – 3 year Bachelor degree should be recognised under the Washington Accord. At this stage there is continuing disagreement on this issue and ASIIN has not been admitted to the Accord beyond its current provisional status.

Closed session debate also occurred concerning the recognition by registration bodies of Washington Accord qualifications in both USA and Singapore. NCEES representative argued that a recent survey has shown that a significant proportion of US States will accept a WA qualification for the purposes of registration, and that NCEES is trying to educate State Boards in this direction. Progress is being made, but ultimately the decision rests with the State Boards. With the PEB Singapore, it was reported a the time that changes to the Registration Act have been almost finalised, and will overcome the problem with the historical, restricted list of recognised programs by referencing instead the Washington Accord listing of recognised programs, as the educational requirement for registration. Since these meetings, this legislation has in fact been passed and has opened up recognition to the Washington Accord listings, but with some implications for offshore and distance mode delivery.

8 INTERNATIONAL OUTREACH

The Associate Director - Accreditation, on behalf of Engineers Australia continues his role as Chair of the continuing monitoring panel evaluating the Accreditation system operated by IPENZ.

A past role for the Associate Director has been Chair of the mentoring team working with the Board of Engineers, Malaysia as this jurisdiction progressed through provisional and then on to full signatory status under the Washington Accord. The successful admission of the Board of Engineers to the Accord in June 2009 was rewarding.

The Accreditation Centre continues to support professional bodies responsible for engineering education program accreditation in developing jurisdictions, including Sri Lanka, China and India. In September of 2009 the Associate Director and the Chair of the Accreditation Board participated as a member of a 5 person Engineers Australia team undertaking a fact finding consultancy to review engineering education and professional engineering registration and development in Papua New Guinea. An extensive report has been submitted and this will steer the development of assessment and accreditation systems under the jurisdiction of the Institution of Engineers, Papua New Guinea. A MOU has since been signed with IEPNG to initiate development steps recommended in this report.

The Associate Director is a member of the FEIAP Education Workgroup which is currently developing guideline resources for emerging accreditation agencies developing accreditation systems within the Asia-

Pacific region. These guidelines will be modelled under the best practices observed within the Washington Accord and EUR-ACE accreditation frameworks and be designed to nurture developing jurisdictions as they progress through the nation building phase and on to seeking admission to the Washington Accord or recognition under the EUR-ACE system.

As the nominee of the Australasian Association of Engineering Education, the Chair of the Accreditation Board represented Engineers Australia at the Workshop and 19th Annual Executive Meeting of the Association of Engineering Education Societies in South Asia and the Pacific (AEESEAP). The main goals of the association are to promote quality improvements in engineering education and especially to support engineering education and educators in the region's developing countries.

The Associate Director Accreditation also chaired a monitoring team which reviewed the Engineers Canada Accreditation System. This involved observing accreditation visits at the University of Ottawa, the Royal Military College Kingston and the University of Ontario Institute of Technology, and the observation of the Accreditation Board decision making processes. A full report was made to the Washington Accord meeting in Kyoto, June 2009, resulting in the continuing recognition of the Canadian accreditation system for a further 6-year period.

9 ACCREDITATION ACTIVITY 2010

General review visits are scheduled to the following universities in 2010:

- Monash University Malaysia campus,
- Australian maritime College – The University of Tasmania,
- Deakin University,
- Deakin University Malaysia campus,
- Australian National University,
- University of Canberra,
- Curtin University – (including Western Australia School of Mines),
- University of South Australia,
- Swinburne University – Sarawak campus,
- University of South Australia – Singapore campus

The following additional visits (or desk top considerations) are scheduled or likely to be scheduled to consider provisional accreditation of new program offerings, transition from provisional to full accreditation, and/or interim reporting outcomes:

- University of Tasmania – Kuwait campus,
- University of Western Australia,
- University of New South Wales,
- Charles Darwin University
- The University of Melbourne,
- University of Tasmania,
- University of the Sunshine Coast

10 INVOICING - ACCREDITATION COST RECOVERY

Under an agreement between ACED and Engineers Australia, 50% of the cost of undertaking accreditation of relevant degree programs offered in Australia by Australian engineering schools is to be recovered from engineering schools for the 2009-2010 financial year. The remaining 50% of the costs are covered from the general revenue of Engineers Australia, principally membership subscriptions. Full cost recovery only occurs for direct travel expenses associated with the additional task of evaluating off-shore program implementations.

Invoices have been recently sent to university engineering schools. Each subscription includes a fixed charge sharing equally 25% of incurred costs between engineering schools and a proportional charge sharing the other 25% of costs on the basis of the number of currently accredited programs that are listed for each school on our website. This worked out to a fixed charge of $2640 per school, and a per program charge of $260 for each accredited program listed for the particular school.

Costs associated with accreditation of VET sector programs, including the proportion of time input from the Associate Director are fully quarantined through a separate accounting system. VET sector accreditation at this stage operates on a fee for service, full cost recovery basis. It is hoped at some later stage that we can move to a subscription based sharing of costs as applies for the university sector.

10.1 Reiteration of cost fundamentals

Engineers Australia undertakes accreditation assessment reviews of both on-shore and off-shore engineering programs (including 3-year Bachelor of Technology and 4-year Bachelor of Engineering single and combined degree programs, Master of Engineering programs, as well as distance education programs) offered by Australian universities. The types of reviews undertaken on Australian campuses comprise:

1. Provisional accreditation reviews of new programs.
2. Transition to full accreditation reviews of new programs once a significant number of graduates have emerged.
3. Full re-accreditation general reviews of accredited programs at five yearly intervals.
4. Interim and follow-up reviews to assess performance against requirements set as a result of prior consideration.

The reviews normally involve a visit to the campus concerned by an accreditation review panel.

Review panels comprise a mix of academics and industry representatives selected for their relevant expertise, together with an Accreditation Visit Manager representing the Accreditation Board supported by the Accreditation Officer.

For offshore program offerings, again programs need to be evaluated for compliance with the Engineers Australia accreditation criteria, and campus visits are required for each of the review types mentioned above. In most cases, program offerings are undifferentiated from those on the home campus of the Australian institution and so the accreditation focus is on the operating environment and the quality systems, rather than the curriculum detail. In these cases a reduced panel is deployed, usually a subset of the previous home campus general review panel, and this minimises costs. Host universities are asked to cover the direct travel and accommodation costs of offshore accreditation visits, and these costs are quarantined in the budget process, so that university subscriptions only contribute to the costs of Australian campus accreditation visits.

The accreditation workload has been increasing over the past 5 years due to the following factors:

- a proliferation of new program developments;
- the introduction of undifferentiated offerings via international campuses and offshore partnerships;
- programs and feeder programs offered through Australian regional campuses;
- the increased role of the Accreditation Centre in conducting workshops and other development assistance;
- increased obligations to the international engineering education Accords; and improved quality assurance of the accreditation function.

This workload is managed primarily by the Associate Director and Accreditation Manager with assistance during peak load periods from the contracted Visit Managers.

With 36 Australian institutions offering engineering programs, the number of accreditation visits to conduct general reviews, interim reviews and new program assessments ranges from 14 to 20 or more per year, depending upon the number of offshore activities that need addressing. The number of accredited professional engineering and engineering technologist degrees offered by Australian universities on home campuses is of the order of 350, and is constantly changing.

The direct costs associated with accreditation visits conducted in Australia include panel members' travel and accommodation expenses, but no payment for time or honorarium is provided to panel members. Indirect costs include staff salaries. The Australian Engineering Accreditation Centre has begun accreditation of Advanced Diploma programs offered by RTOs in the TAFE sector. A small proportion of the accreditation budget is allocated to allow for the costs of this activity. These costs are recovered directly from the RTOs involved. TAFE accreditation activities are managed through a separate budget account to ensure costs are fully quarantined from the Higher Education Accreditation activity.

Accreditation Board members receive no remuneration, but their travel expenses for face-to-face meetings away from their home city are met. The Board normally holds a maximum of four meetings a year, of which not more than two are face-to-face. The others are teleconferences, and some business is conducted by correspondence.

The costs of engagement with the international engineering accords are integral to the Engineers Australia accreditation budget. Mandatory costs include travel, accommodation and registration for biennial meetings of the accords and biennial workshops. Engineers Australia shares with other signatories in maintaining the standards of these accords. Activities include contributing as Chair or as a team member of verification and periodic monitoring panels and also through formal mentoring processes, providing assistance to new jurisdictions seeking signatory status to the accords. The direct costs associated with such verification, monitoring and mentoring activity are recovered from the target jurisdiction.

11 2010 ACCREDITATION WORKSHOPS

Accreditation Workshops are scheduled for 24 March (Melbourne) and 21 July (Brisbane). The March workshop in Melbourne was very well attended with some 13 universities represented. Attendees mostly include Associate Deans (T&L), Program Directors/Leaders, senior academic staff engaged in the curriculum design and development roles, QA staff and occasionally administration staff engaged in the accreditation visit preparation.

The Accreditation Management System published by Engineers Australia and first utilized in 2005 is now well established, with the self study documentation template widely used for preparation of submission documentation. The standard and consistency of submission documents has dramatically improved over the past 5 years and the cost and effort behind the preparation of these self-review submissions is greatly appreciated by panels. It is our belief that these do provide a useful reference framework for the processes of continuing improvement within the host educational institution.

Accreditation workshops we believe contribute significantly to the professional development of engineering academics, not only in preparing for accreditation, but more generally in broadening the understanding and commitment to systematic, outcomes based educational design and review. It provides an opportunity for building a solid appreciation of the role that engineers Australia fulfils in assuring standards of education and professional practice and also for developing a full understanding of the international context and umbrella under which the Accreditation Centre operates.

A further accreditation workshop is likely to be held in Perth during the second semester of 2010.

12 Accreditation at the Engineering Associate Level

Fully fledged Accreditation Management Systems have now been developed and are ready for publishing as a basis for accreditation at this level - both for curriculum and competency based program design.

Within the TAFE context, the Advanced Diploma is typically the candidate training program, developed under a training package definition of designated competencies within the specific field of practice. In the Higher Education context, the candidate program is frequently the Associate Degree, or in at least one case the Advanced Diploma, in this case constructed in a traditional fashion from individual academic units or modules with individual learning outcomes and assessment processes aggregating to deliver program objectives and graduate outcomes prescribed by the educational provider, and based on industry advice and independent benchmarking.

Accreditation visits were conducted to Chisholm Institute of TAFE and Southbank Institute of Technology during 2009. The Accreditation Centre has continued its work with the Manufacturing Skills Council (MSA

ISC), The ElectroComms and Energy Utilities Skills Council (EE-Oz ISC) and the Innovation and Business Services Australia Skills Council (IBSA ISC) assisting with training package developments, and mapping of competencies against the Engineers Australia Stage 1 Standard. In addition, in conjunction with EE-Oz ISC, the Accreditation Centre conducted a joint national workshop on August 6, 2009 on the accreditation requirements for the Advanced Diploma of Electrical Engineering.

To assist with all of this development work, we have employed Mr Noel Miller, ex Ford Motor Company (Aust) Training Manager in a part time capacity during 2009 as VET Accreditation Manager. With the successful delivery of the full Accreditation Management Systems at the Engineering Associate level, this appointment has now concluded. Noel will now transition to a Visit Manager role and be contracted to undertake accreditation visits at this level as required.

The Centre has also been consulting with a range of TAFE institutions and RTOs in various states as preparations are made for these bodies to submit Advanced Diploma and Bachelor of Engineering Technology programs for accreditation during the second, third and fourth quarters of 2010.

13 ALTC PROJECT - Curriculum Specification and Support Systems for Engineering Education that Address Revised Qualification Standards

This funded ALTC project arising from the 2008 Engineers for the Future project includes a sub-project area that is addressing the revision of standards for engineering awards to underpin curriculum revision. A key component of this sub-project is the revision of the Stage 1 Competency Standards published by Engineers Australia. These standards express expectations of graduate competencies at the occupational levels of Professional Engineer, Engineering Technologist and Engineering Officer, and referenced to the Graduate Profile Exemplar statements developed by the educational accords under the International Engineering Alliance. They also provide a template for universities to use in developing a specification of graduate outcome targets for engineering education programs in specific disciplines.

In revising the Stage 1 Competency Standards the sub-project implementation team has consulted widely, and especially with the engineering education sector for initial input to the review. At this stage the primary data gathering has been completed and a first cut revision of the Competency Standards has been drafted. This will then be systematically reviewed by the various stakeholder groups before presentation to Council as a final proposal by July of 2010. Stakeholder groups include the Engineers Australia College Boards, the National Committee of Engineering Associates Australia and the National Committee of Engineering Technologists Australia, a wide range of industry representatives as well as the Associate Deans (Teaching and Learning) group identified by the Australian Council of Engineering Deans. A core reference group of seven university engineering schools has been established.

An advance draft of the revised Stage 1 Competency Standard for the career category of Professional Engineer is provided as ***Attachment 2*** for information at this stage. Action word definitions will be included as the document is progressed.

14 ENGINEERING ACADEMIC STAFF – PROFESSIONAL AFFILIATIONS

The Accreditation Consultative Committee (ACC) at its 2009 meeting considered an objective of the ACED to strengthen the proportion of academic engineering staff holding professional body membership and in particular chartered status and /or registration.

In order to assess the current status of professional body involvement the ACC asked Engineers Australia to survey all engineering schools in Australia to gather data on the current status of professional body membership and professional registration of engineering academics.

This survey was undertaken in late 2009 and most results have been received from engineering schools. An interim report showing data received so far is provided in ***Attachment 3***. It is anticipated that the remaining data will be received by the time of the ACED meeting and an updated table will be provided on the day.

END REPORT

ATTACHMENT 1

International Engineering Alliance – Education Accords

Graduate Outcomes Exemplar Statements

As ratified at IEA Biennial meetings Kyoto June 2009

- **Washington Accord – 4+ year Professional Engineer programs**
- **Sydney Accord – 3+ years Engineering Technologist programs**
- **Dublin Accord – 2+ years Engineering Associate programs**

July 2009

Accord programme profiles

The following tables provide profiles of graduates of three types of tertiary education engineering programmes. See below for definitions of complex engineering problems, broadly-defined engineering problems and well-defined engineering problems.

Knowledge profile

A Washington Accord programme provides:	**A Sydney Accord programme** provides:	**A Dublin Accord programme** provides:
A systematic, theory-based understanding of the **natural sciences** applicable to the engineering discipline focussed on by the programme	A systematic, theory-based understanding of the **natural sciences** applicable to the sub-discipline focussed on by the programme	A descriptive, formula-based understanding of the **natural sciences** applicable in the sub-discipline focussed on by the programme
Conceptually-based **mathematics**, numerical analysis, statistics and formal aspects of computer and information science to support analysis and modelling applicable to the discipline	Conceptually-based **mathematics**, numerical analysis, statistics and aspects of computer and information science to support analysis and use of models applicable to the sub-discipline	Procedural **mathematics,** numerical analysis, statistics applicable in a sub-discipline
A systematic, theory-based formulation of **engineering fundamentals** required in the engineering discipline	A systematic, theory-based formulation of **engineering fundamentals** required in an accepted sub-discipline	A coherent procedural formulation of **engineering fundamentals** required in an accepted sub-discipline
Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.	**Engineering specialist knowledge** that provides theoretical frameworks and bodies of knowledge for an accepted sub-discipline	**Engineering specialist knowledge** that provides the body of knowledge for an accepted sub-discipline
Knowledge that supports **engineering design** in a practice area	Knowledge that supports **engineering design** using the technologies of a practice area	Knowledge that supports **engineering design** based on the techniques and procedures of a practice area
Knowledge of **engineering practice** (technology) in the practice areas in the engineering discipline	Knowledge of **engineering technologies** applicable in the sub-discipline	Codified **practical engineering knowledge** in recognised practice area.
Comprehension of the role of engineering in society and identifies issues in engineering practice in the discipline: ethics and the professional responsibility of an engineer to public safety; the impacts of engineering activity: economic, social, cultural, environmental and sustainability;	**Comprehension** of the role of technology in society and identifies issues in applying engineering technology: ethics and impacts: economic, social, environmental and sustainability	**Knowledge** of issues and approaches in engineering technician practice: ethics, financial, cultural, environmental and sustainability impacts
Engagement with selected knowledge in the **research literature** of the discipline	Engagement with the **technological literature** of the discipline	
A programme that builds this type of	*A programme that builds this type of knowledge*	*A programme that builds this type of knowledge*

knowledge and develops the attributes listed below is typically achieved in 4 to 5 years of study, depending on the level of students at entry.	*and develops the attributes listed below is typically achieved in 3 to 4 years of study, depending on the level of students at entry.*	*and develops the attributes listed below is typically achieved in 2 to 3 years of study, depending on the level of students at entry.*

Graduate Attribute profiles

	Attribute	Differentiating Characteristic	… for Washington Accord Graduate	… for Sydney Accord Graduate	… for Dublin Accord Graduate
1.	**Engineering Knowledge**	Breadth and depth of education and type of knowledge, both theoretical and practical	Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems	Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to defined and applied engineering procedures, processes, systems or methodologies.	Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to wide practical procedures and practices.
2.	**Problem Analysis**	Complexity of analysis	Identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.	Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation.	Identify and analyse well-defined engineering problems reaching substantiated conclusions using codified methods of analysis specific to their field of activity.
3.	**Design/ development of solutions**	Breadth and uniqueness of engineering problems i.e. the extent to which problems are original and to which solutions have previously been identified or codified	Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.	Design solutions for broadly-defined engineering technology problems and contribute to the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.	Design solutions for well-defined technical problems and assist with the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
4.	**Investigation**	Breadth and depth of investigation and experimentation	Conduct investigations of complex problems using research-based knowledge	Conduct investigations of broadly-defined problems; locate, search and select	Conduct investigations of well-defined problems; locate and search relevant codes and catalogues, conduct standard

			and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.	relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions.	tests and measurements.
5.	**Modern Tool Usage**	Level of understanding of the appropriateness of the tool	Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities, with an understanding of the limitations.	Select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to broadly-defined engineering activities, with an understanding of the limitations.	Apply appropriate techniques, resources, and modern engineering and IT tools to well-defined engineering activities, with an awareness of the limitations.
6.	**The Engineer and Society**	Level of knowledge and responsibility	Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.	Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice.	Demonstrate knowledge of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technician practice.
7.	**Environment and Sustainability**	Type of solutions.	Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.	Understand the impact of engineering technology solutions in societal and environmental context and demonstrate knowledge of and need for sustainable development.	Understand the impact of engineering technician solutions in societal and environmental context and demonstrate knowledge of and need for sustainable development.
8.	**Ethics**	Understanding and level of practice	Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.	Understand and commit to professional ethics and responsibilities and norms of engineering technology practice.	Understand and commit to professional ethics and responsibilities and norms of technician practice.
9.	**Individual and Team work**	Role in and diversity of team	Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.	Function effectively as an individual, and as a member or leader in diverse technical teams.	Function effectively as an individual, and as a member in diverse technical teams.

10.	**Communication**	Level of communication according to type of activities performed	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	Communicate effectively on broadly-defined engineering activities with the engineering community and with community and with society at large, by being able to comprehend the work of others, document their own work, and give and receive clear instructions	Communicate effectively on well-defined engineering activities with the engineering community and with society at large, by being able to comprehend the work of others, document their own work, and give and receive clear instructions
11.	**Project Management and Finance**	Level of management required for differing types of activity Note: needs level Statement.	Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects in multidisciplinary environments	Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a technical team and to manage projects in multidisciplinary environments
12.	**Life long learning**	Preparation for and depth of continuing learning.	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.	Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.	Recognize the need for, and have the ability to engage in independent updating in the context of specialized technical knowledge.

Common Range and Contextual Definitions

Range of Problem Solving

Attribute		Complex Problems	Broadly-defined Problems	Well-defined Problems
1	Preamble	Engineering problems which cannot be resolved without in-depth engineering knowledge, much of which is at, or informed by, the forefront of the professional discipline, and having some or all of the following characteristics:	Engineering problems which cannot be pursued without a coherent and detailed knowledge of defined aspects of a professional discipline with a strong emphasis on the application of developed technology, and having the following characteristics	Engineering problems having some or all of the following characteristics:
2	Range of conflicting requirements	Involve wide-ranging or conflicting technical, engineering and other issues	Involve a variety of factors which may impose conflicting constraints	Involve several issues, but with few of these exerting conflicting constraints
3	Depth of analysis required	Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models	Can be solved by application of well-proven analysis techniques	Can be solved in standardised ways
4	Depth of knowledge required	Requires research-based knowledge much of which is at, or informed by, the forefront of the professional discipline and that supports a fundamentals-based first principles analytical approach	Requires a detailed knowledge of principles and applied procedures and methodologies in defined aspects of a professional discipline with a strong emphasis on the application of developed technology and the attainment of know-how, often within a multidisciplinary engineering environment	Can be resolved using limited theoretical knowledge but normally requires extensive practical knowledge
5	Familiarity of issues	Involve infrequently encountered issues	Belong to families of familiar problems which are solved in well-accepted ways	Are frequently encountered and thus familiar to most practitioners in the practice area
6	Extent of applicable codes	Are outside problems encompassed by standards and codes of practice for professional engineering	May be partially outside those encompassed by standards or codes of practice	Are encompassed by standards and/or documented codes of practice
7	Extent of stakeholder involvement and level of conflicting requirements	Involve diverse groups of stakeholders with widely varying needs	Involve several groups of stakeholders with differing and occasionally conflicting needs	Involve a limited range of stakeholders with differing needs
8	Consequences	Have significant consequences in a range of contexts	Have consequences which are important locally, but may extend more widely	Have consequences which are locally important and not far-reaching
9	Interdependence	Are high level problems including many component parts or sub-problems	Are parts of, or systems within complex engineering problems	Are discrete components

Range of Engineering Activities

Attribute		Complex Activities	Broadly-defined Activities	Well-defined Activities
1	Preamble	Complex activities means (engineering) activities or projects that have some or all of the following characteristics:	Broadly defined activities means (engineering) activities or projects that have some or all of the following characteristics:	Well-defined activities means (engineering) activities or projects that have some or all of the following characteristics:
2	Range of resources	Involve the use of diverse resources (and for this purpose resources includes people, money, equipment, materials, information and technologies)	Involve a variety of resources (and for this purposes resources includes people, money, equipment, materials, information and technologies)	Involve a limited range of resources (and for this purpose resources includes people, money, equipment, materials, information and technologies)
3	Level of interactions	Require resolution of significant problems arising from interactions between wide-ranging or conflicting technical, engineering or other issues	Require resolution of occasional interactions between technical, engineering and other issues, of which few are conflicting	**Require resolution of interactions between limited technical and engineering issues with little or no impact of wider issues**
4	Innovation	Involve creative use engineering principles and research-based knowledge in novel ways	Involve the use of new materials, techniques or processes in non-standard ways	Involve the use of existing materials techniques, or processes in modified or new ways
5	Consequences to society and the environment	Have significant consequences in a range of contexts, characterized by difficulty of prediction and mitigation	Have reasonably predictable consequences that are most important locally, but may extend more widely	Have consequences that are locally important and not far-reaching
6	Familiarity	Can extend beyond previous experiences by applying principles-based approaches	Require a knowledge of normal operating procedures and processes	Require a knowledge of practical procedures and practices for widely-applied operations and processes

ENGINEERS AUSTRALIA
STAGE 1 COMPETENCY STANDARD FOR PROFESSIONAL ENGINEER 2010 REVISION

ADVANCE DRAFT

ATTACHMENT 2

1. KNOWLEDGE AND SKILL BASE

ELEMENT	EVIDENCE – AT THE LEVEL OF PROFESSIONAL ENGINEER
Science foundations	• Systematic, theory based **understanding of** the physical, biological and environmental sciences appropriate to the specific engineering discipline.
Enabling mathematics, computer and information sciences	• Conceptual understanding of mathematics, numerical analysis, statistics, and computer and information sciences to engineering analysis, evaluation, prediction, modeling and synthesis tasks relevant to the specific engineering discipline.
Engineering fundamentals	• Systematic, theory based **understanding and ability to** fluently apply of engineering fundamentals underpinning the specific engineering discipline.
Specialist and research knowledge	• In depth **understanding of** specialist bodies of knowledge that define the established practice areas of the specific engineering discipline. • Broad **understanding of** current developments, advanced technologies, critical issues and interdisciplinary linkages in at least one specialist practice area within the specific engineering discipline. • **Knowledge of** selected research literature in at least one specialist practice area of the specific engineering discipline.
Contextual knowledge	• **Understanding of** the interactions between engineering systems and people in the social, cultural, environmental, commercial, legal and political contexts in which they operate, including both the positive role of engineering in sustainable development and the potentially adverse impacts of engineering activity. • **Understanding of** the foundation principles of human factors relevant to the engineering discipline. • **Knowledge of** the fundamental principles of business and enterprise management. • **Understanding of** the structure, roles and capabilities of the engineering workforce.

Engineering practice knowledge, including design	• **Broad understanding of** the nature of engineering practice, aligned to the specific engineering discipline. • **Understanding of** the principles of engineering design relevant to the specific engineering discipline. • **Knowledge of** the development and relevance of standards and codes of practice used in the engineering discipline. • **Knowledge of** the Engineers Australia - Code of Ethics, and established norms of engineering practice relevant to the engineering discipline. • **Knowledge of** the principles of safety engineering, risk management and the health and safety responsibilities of the professional engineer, including legislative requirements. • **Understanding of** the social, environmental and economic principles of sustainable engineering practice. • **Understanding of** the fundamental principles of engineering project management as a basis for planning, organizing and managing resources within a complex engineering project cycle. • **Understanding of** the fundamental concepts, methodologies and structures of systems engineering as a holistic basis for managing complexity in engineering practice.

2. ENGINEERING APPLICATION and SKILLS

ELEMENT	EVIDENCE – AT THE LEVEL OF PROFESSIONAL ENGINEER
Engineering method	• **Ability to** fluently apply mathematics, scientific method and engineering fundamentals to the analysis and solution of *complex* engineering problems in the engineering discipline. • **Ability to** define and characterise engineering problems, analyse causes and effects, justify and apply appropriate simplifying assumptions, identify technical risks, predict performance and behaviour and synthesise solution strategies. • **Ability to** ensure that all aspects of an engineering activity are soundly based on fundamental principles: eg by diagnosing calculations, proposals and results that may be ill-founded, illogical or unrealistic; correctly identifying missing or erroneous data and sources of error; and by executing appropriate corrective action. • **Ability to** handle engineering problems involving uncertainty, imprecise information and wide-ranging and conflicting technical and non-technical factors. • **Ability to** partition *complex* problems, processes or systems into manageable elements for the purposes of analysis, modeling or design and then re-combining to form a whole, with the integrity and performance of the overall system as the paramount consideration. • **Ability to** conceptualise alternative engineering approaches and evaluate their potential performance outcomes against appropriate criteria to justify an optimal solution. • **Ability to** use relevant standards and codes of practice in the solution of engineering problems in the chosen engineering discipline and specialisations. • **Awareness and ability to** identify, quantify, mitigate and manage health and safety risks associated with engineering application in the discipline and chosen specialisations. • **Awareness and ability to** interpret and apply legislative and statutory requirements applicable to the engineering discipline.
Tools, techniques and resources	• **Proficiency in** recognising and selecting materials, devices and systems relevant to the engineering discipline and related fields. • **Ability to** construct from a qualitative description of a phenomenon, process, system, component or device - a mathematical, physical or computational model based on fundamental scientific principles and justifiable simplifying assumptions. • **Ability to** apply such models to analysis and design, understanding their applicability, accuracy and limitations. • **Ability to** determine properties, performance, safe working limits, failure modes, and other inherent parameters of materials, devices and systems relevant to the engineering discipline. • **Proficiency in** the use of modern engineering tools for analysis, simulation, visualization, synthesis and design,

	including **ability to** assess the accuracy and limitations of such tools, and validate their results. • **Ability to** use systems engineering work-processes and tools, (or equivalent holistic approaches), to address complex, inter-disciplinary problems and projects. • **Proficiency in** the design and conduct of experiments, measurement and instrumentation regimes, analysis and interpretation of result data and the formulation of reliable conclusions. • **Ability to** perceive possible sources of error in models and experiments, and eliminate, minimize or compensate for them, and to quantify their significance to any conclusions drawn. • **Proficiency in** the safe application of laboratory, test and experimental procedures in the engineering discipline.
Engineering Design	• **Proficiency in** the application of technical knowledge, established design methodologies, and appropriate tools and resources to design components, systems and/or processes to meet specified performance criteria, including compliance with appropriate standards and codes of practice. • **Ability to** undertake design within broad contextual settings, accommodating social, cultural, environmental, commercial, legal and political aspects, human factors, and health, safety and sustainability imperatives as an integral part of the design process. • **Ability to** execute a full design cycle as part of a *complex* problem solution, including the tasks of: o eliciting, scoping and documenting the required outcomes of a design task and defining acceptance criteria; o considering the impact of all contextual, development, production and implementation factors including risk identification and management; o writing functional specifications, using engineering methods and standards, that meet the user requirements; o identifying and analysing possible design concepts, and proposing and justifying an optimal solution; o developing and completing the design using appropriate engineering principles, tools, and processes; o specifying the equipment and operating arrangements needed; o ensuring integration of all functional elements to form a coherent, self-consistent system; o checking performance of each element and of the system as a whole; o checking the design solution against the engineering and functional specifications; o quantifying the engineering tasks required to implement the chosen solution; o devising and documenting tests to verify performance and take any corrective action necessary. • **Awareness of** the accountabilities of the professional engineer as the 'design authority'.

Conduct of engineering projects	• **Proficiency in** the application of basic tools and practices of formal project management to the planning and execution of *complex* project work, targeting the delivery of a significant outcome to a professional standard. • **Ability to** contribute to the planning and execution of complex engineering projects, making contributions as an individual, team member and team leader. • **Ability to** identify the essential information requirements and realistically assess the scope, dimensions, scale of effort and indicative costs of a project. • **Awareness of** the need to accommodate relevant contextual issues into all phases of engineering project work, including the fundamentals of business planning and financial management • **Awareness of** the need to plan and quantify performance over the full life-cycle of a project or program - integrating technical performance with contextual outcomes. • **Ability to** implement sustainable practices in all facets of engineering project work.
Research and Investigation	• **Ability to** conduct investigations of *complex* problems using research-based knowledge and research methods - including design of experiments, analysis and interpretation of data and synthesis of information.

3. PROFESSIONAL SKILLS, VALUES AND ATTITUDES

ELEMENT	EVIDENCE – AT THE LEVEL OF PROFESSIONAL ENGINEER
Ethics and professional accountability	• **Ability to** apply ethical principles and a commitment to the tenets of the Engineers Australia Code of Ethics in all aspects of engineering practice. • **Understanding of** the need for 'due-diligence' in assuring compliance with legislative and statutory requirements relevant to the discipline. • **Understanding of** the responsibilities of the engineer for the safety of other people and for protection of the environment. • **Understanding of** the fundamental principles of intellectual property rights.
Communication	• **Proficiency in** listening, speaking, reading and writing English, including:. o comprehending critically and fairly the viewpoints of others; o expressing information effectively and succinctly when conveying information, issuing instruction, engaging in discussion, presenting arguments, debating and negotiation, to technical and non-technical audiences and using textual, diagrammatic, pictorial and graphical media best suited to the context; o representing an engineering position, or the engineering profession at large to the broader community; o appreciating the impact of body language, personal behaviour and other non-verbal communication processes, as well as the fundamentals of human social behaviour and their cross-cultural differences . • **Ability to** maintain a professional journal and records and to produce high quality engineering documents such as progress reports, project reports, reports of investigations, proposals, designs, briefs, technical directions and instructions.
Creativity and innovation	• **Ability to** apply creative approaches to identify and develop alternative solutions, concepts and procedures, and develop confidence to challenge engineering practices from technical and non-technical viewpoints and identify new engineering opportunities. • **Ability to** seek out new developments in engineering and technology and to apply fundamental knowledge to evaluate them. Value. • **Awareness of** fields of science, engineering and technology from which new ideas and interfaces with the engineering discipline may develop, and readily engage with practitioners from these fields to exchange ideas.

Information literacy	• **Proficiency in** information location and utilization - including accessing, systematically searching, analyzing, evaluating and referencing relevant published works through the use of bibliographic databases and other resources. • **Ability to** assess the accuracy, reliability and authenticity of information. • **Awareness of** common document identification and control procedures.
Self reflection and personal development	• **Understanding of and commitment to** critical self-review and performance evaluation against appropriate criteria as a primary means of tracking personal development needs and achievements. • **Understanding of** the importance of being a member of a professional and intellectual community, learning from its knowledge and standards, and contributing to their maintenance and advancement. • **Awareness of** the need for to life-long professional development.
Personal characteristics	• **Ability to** manage time and processes effectively, prioritising competing demands to achieve personal and team goals and objectives. • Well developed interpersonal and intercultural skills. • **Ability to** think critically and apply an appropriate balance of logic and intellectual criteria to understanding, analysis or judgment. • **Ability to** present a professional image in all circumstances, including in relations with clients, suppliers and stakeholders as well as professional and technical colleagues.
Team skills and leadership	• **Ability to** function as an effective member or leader of diverse teams, including those with multi-level, multi-disciplinary and multi-cultural dimensions, based on basic understanding of team dynamics. • **Ability to** earn the trust and confidence of colleagues through competent and timely completion of tasks. • **Ability to** recognise the value of alternative and diverse viewpoints and the importance of professional networks. • **Ability to** mentor others, and accept mentoring from others, in technical and professional domains. • **Ability to** take initiative and leadership while respecting others' agreed roles.

ENGINEERS AUSTRALIA SURVEY

ATTACHMENT 3

ON BEHALF OF ACED/ EA CONSULTATIVE COMMITTEE

UNIVERSITY	Total number of full time engineering academic staff involved in teaching - engineering education programs at this university	How many of above staff hold corporate membership of Engineers Australia in the grade of Graduate, Member or Fellow	How many of above staff hold Chartered Status and/or registration through Engineers Australia	How many of above staff are corporate members of an alternative professional body eg IEEE, IChemE, ICE, ASME, ICE, IET, AusIMM	How many of above staff hold Chartered Status and/or registration with a professional /licensing body equivalent to Engineers Australia – (either in Australia or overseas.
ADELAIDE	105	20	17	79	18
ANU	40	4	1	23	0
CDU	16	10	5	7	2
CQU	30	10	6	17	4
CURTIN	133	28	6	82	11
ECU	14	6	1	4	0
FLINDERS	12	2	0	8	1
GRIFFITH	41	5	8	13	7
LATROBE	15	3	3	4	1
LATROBE BENDIGO	5	4	3	0	0
MACQUARIE	9	2	0	9	0
MURDOCH	9	7	2	8	0
NEWCASTLE	60	23	13	22	14
QUT	70	32	25	54	19
RMIT	157	40	9	98	4
SWINBURNE	37	20	12	9	5
SYDNEY	67	17	12	27	2
UNISA	37	14	6	26	0
UNSW**	68	13	10	52	13
UQ	96	15	11	56	5
USQ	59	28	15	19	6
UTAS	17	9	4	8	1
UTS	67	17	12	27	2
UWA	64	13	6	41	5
WOLLONGONG	66	7	5	7	5
VICTORIA UNIV	41	13	3	24	2
TOTALS	**1335**	**362**	**195**	**724**	**127**

**** Partial response only at this stage - but indicative proportions**

Responses from The University of Melbourne, Deakin University, Australian Defence Force Academy, Monash University, James Cook University, University of Western Sydney, University of Ballarat are anticipated to be available by the ACED meeting on 9 April and will be tabled.