

出國報告（出國類別：參與研討會）

## 2005 國際工程會議 (International Engineering Meetings 2005)

服務機關：中華工程教育學會

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派赴國家：香港

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## 摘要

每二年召開的國際工程會議(International Engineering Meetings，簡稱 IEM)今年於 6 月 12~17 日假香港 Le Meridian Hotel 舉行，主辦單位為香港工程師學會 (Hong Kong Institute of Engineers)。IEM 實際上包括多個教育協定(Washington Accord, Dublin Accord, Sydney Accord)的會議與專業工程師流動(Professional Engineer Mobility)會議。報名此次大會的人數屬例年來最高，共計有近 25 個國家約 140 人參與。

中華工程教育學會(Institute of Engineering Education Taiwan，簡稱 IEET)今年由魏理事長哲和親自帶領全團共九位團員前往參與此次會議。除因受邀參與此次大會外，IEET 此行另一重大任務即為參與第七屆「華盛頓協定」會議(7<sup>th</sup> Biennial Washington Accord Meeting)會議。IEET 已於 2005 年 1 月向「華盛頓協定」(Washington Accord，簡稱 WA)申請成為該協定之準會員。

因 WA 的會議較有關我國目前推動認證的工作，IEET 大多數報名參與此項會議。這次 WA 會議所討論的議題相當豐富，除了申請正式會員、準會員的組織將報告外，重要議程尚包括會員近年來所研擬之「WA 入會資格與方式」(Granting Provisional Admission / Signatory Status)，「專業秘書處」(Professional Secretariat Proposal)，「畢業生核心能力」(Graduate Attributes)及其他多項提案。IEET 於此次大會收穫頗豐，除與多個會員組織進行更加密切的交流外，IEET 也於 WA 會議上獲得全數會員的一致支持，順利成為 WA 的準會員。

## 背景與組團宗旨/目的：

於 1989 年，美國、加拿大、澳洲、紐西蘭、英國及愛爾蘭等六個國家所屬的非政府工程教育認證組織，共同簽署了一份協定，稱之為「華盛頓協定」(Washington Accord，簡稱 WA)，以相互承認彼此認證的工程科技學位；爾後，於 1995 年與 1999 年，分別又有南非以及香港等兩個會員組織(signatories)的加入。這份協定最主要精神是在「實質相當」(substantially equivalent)的前提下，讓各簽署會員得以互相承認其工程科技教育之認證標準與程序。換言之，以華盛頓協定為基礎，各會員組織之間所認證過的工程教育學位，在透過實質相當的認證規範及程序中，可以達到彼此所認定的水準。如此一來，不但可以讓各會員組織互相承認該國所授予的工程及科技學位與課程，以達到國際化的目標，同時更可以藉由工程科技教育認證的執行，提昇會員國家工程教育的品質，以因應科技快速發展的需求。

在台灣，政府相關部會與許多工程科技教育學者，早已注意到華盛頓協定的重要角色及其對國際工程科技教育的顯著影響，於 2003 年 6 月，前任行政院國家科學委員會主委魏哲和教授特遴派成功大學歐善惠副校長、台灣大學工學院楊永斌院長以及台灣大學應力所胡文聰教授等人，徵得 WA 同意，以觀察員(observer)的身分代表中華工程教育學會出席在紐西蘭舉辦的兩年一度的「第六屆華盛頓協定會議」。上述三位學會代表在此次會議中，不但與華盛頓協定各會員代表建立起良好的友誼關係，同時也於會議之閉幕式中，明確表達加入華盛頓協定的強烈意願，希望中華工程教育學會在 2005 年 6 月的第七屆會議中，

能夠繼日本、德國、新加坡、馬來西亞等國之後，申請成為臨時會員(Provisional Signatory)，並進而尋求升等為 WA 正式會員，以積極促成我國工程科技教育的國際化。

中華工程教育學會 (IEET)已於 2005 年 1 月 31 日向 WA 秘書處繳交文件提出正式申請成為臨時會員國，且將於此次大會上報告並接受表決。IEET 將由理事長兼認證委員會主任委員魏哲和教授擔任團長組團以大會觀察員身份參與。

## 會議過程

會議時間：2005 年 6 月 12~17 日

會議地點：香港 Le Meridian Hotel

與會成員：共計有包括來自澳洲、孟加拉、中國、台灣、埃及、德國、歐盟、香港、印度、愛爾蘭、牙買加、日本、韓國、馬來西亞、紐西蘭、菲律賓、俄羅斯、新加坡、南非、斯里蘭卡、泰國、英國、及美國等代表團成員約 140 人。

**IEET 團員**：理事長魏哲和教授、秘書長楊永斌教授、副秘書長顏家鈺教授、國際關係處處長胡文聰教授、認證標準與規範委員會副召集人張佩芬教授、國際合作委員會主任委員王偉中教授、教育部顧問室研究員吳亞君博士、國際關係處副處長劉曼君博士、及認證委員會專案經理何佳玲小姐等共九位。

## 大會整體議程

- 6 月 12 日—大會註冊及歡迎酒會
- 6 月 13 日—教育論壇 (Education Forum)

- 6月14日—專業工程師流通論壇(Mobility Forum)—亞太工程師 (APEC Engineer)、EMF (Engineering Mobility Forum)
- 6月15日—教育論壇 (Education Forum)—華盛頓協定(Washington Accord)
- 6月16日—專業工程師流通論壇(Mobility Forum)—雪梨協定(Sidney Accord)、都柏林協定(Dublin Accord)
- 6月17日—專業工程師流通論壇—亞太工程師 (APEC Engineer)

**第七屆華盛頓協定(Washington Accord)會議摘要：**

**6月13日**

- 大會首先通過議程，期間加拿大(CCPE)對新加坡申請成為正式會員一案提出執疑，CCPE指出其並未於開會前被知會此項申請案，因此加拿大已決定對新加坡的申請案投棄權票。因正式會員申請必須取得全數會員的支持，加拿大此舉已明顯注定新加坡不可能於此次大會獲得正式會員的資格。
- 本日並確定此次 Washington Accord (WA)會議的議程 (附件 1)，如下表所載：

Schedule	Organization	Individual
Granting Provisional Admission/Signatory Status	Engineers Australia	Maurice Allen
Mentoring Guidelines	IPENZ	Basil Wakelin
Monitoring/Review Visits	IPENZ	Basil Wakelin

Distance Delivery/Programs Delivered Across Boundaries	Engineers Australia	Alan Bradley
Professional Secretariat Proposal	ABET, Inc.	Kathryn Aberle
Graduate Attributes/Professional Competence	ECSA	Hu Hanrahan

註：「跨國界的學程」(Programs Delivered Across Boundaries)是近幾年內「華盛頓協定」會員組織間所討論的重要議題之一。因包括澳洲、紐西蘭等國家都有學校於他國設立分校，這對教育學程的認證便是一項具挑戰性的工作。認證組織必須確定國外分校的學程與校本部(原認證過的)學程的教育品質實質相當。詳細「跨國界的學程」的提案見附件 2。

- **專職秘書處方案 (Professional Secretariat Proposal, 美國 ABET 的 Kate Aberle 提案，附件 3)**

因應「華盛頓協定」一直以來尚未有完整的秘書處規劃方案，ABET 的 Kate Aberle 於此次大會上提案討論，內容包括：

- 議題源由
- 秘書處的角色
- 基本的原則
- 工作小組所建議的模式
- 模式的評量

## ■ 結論

註：ABET 表示將願意於此次大會後繼續擔任秘書處的工作，以延續目前的工作。爾後會員通過 ABET 的提案，WA 的秘書處將由 ABET 繼續擔任。

- 一直以來，「華盛頓協定」會員並未繳交任何相關會費，但為因應逐年增加的正式會員與準會員，業務量已蒸蒸日上，WA 秘書處(ABET)建議擬定會費標準以支付相關事務的費用，例如秘書處的花費、年會的舉辦等等。會費標準取決於該認證組織所認證學系的數量，意即若一認證單位認證愈多學程則其所應繳之費用就愈高。由 ABET 主導的工作小組建議以下的收費標準：

### 對正式會員建議以下收費標準：

Australia	US\$9,100
Canada	US\$9,100
Hong Kong	US\$6,425
Ireland	US\$6,425
New Zealand	US\$6,425
S. Africa	US\$6,425
United Kingdom	US\$11,775
United States	US\$11,775

### 對準會員建議以下之收費標準：

Germany	US\$1,185
Japan	US\$1,185
Malaysia	US\$1,185
Singapore	US\$1,185

註：IEET 應密切注意此項提案的發展，雖說以目前提案的標準來說，準會員的收費額度皆相同，亦即 US\$1,185，但爾後待 IEET 順利成為正式會員後，



因國內工程教育系所的眾多，一旦國內參與認證的學系劇增，IEET 所須負擔的會費將直線上升。未來 IEET 的年度預算估計必須加入 WA 會費，以支付該項費用。

- **Graduate Profiles (南非 Prof. Hu Hanrahan，附件 4)**

Graduate Profiles 之訂定可追溯於 2001 年當 WA 在 Thornybush 召開大會時，WA 正式會員即提議建立一套畢業生核心能力制度來區分各個教育協定的特質，例如 WA, Sydney Accord, 及 Dublin Accord。之後，負責起草的工作小組（由紐西蘭 IPENZ 主導）即開始探討各會員組織的認證規範內容，此項研究分析並於 2003 年於紐西蘭召開的大會上修改及表格化，且會員組織已於 2004 年 WA 倫敦會議上對 Graduate Profiles 的草稿認可。

簡而言之，Graduate Profiles 代表會員組織間對全球工程教育類畢業生核心能力的願景。其實質上為一畢業生核心能力系統，各細項皆以清楚、簡潔及可評量(assessable)的文字來敘述屬於各協定組織(WA, Sydney Accord, Dublin Accord)會員的教育單位所須要求的畢業生核心能力。目的在於備有一套畢業生核心能力系統以引領會員組織、準會員及有意申請成為準會員的組織發展其認證規範，而非以建立一套制式化的「國際認證規範」為目的。

註：IEET 的提名者澳洲與紐西蘭已早於 WA 大會近半年前將 Graduate Profiles 草稿提供給 IEET 參考，而 IEET 也將其之 AC2004 規範三的內容(即規範 3.1.1~3.1.8) 與 Graduate Profiles 做對比。大致上來說，AC2004 中已大部分符合，

但有些項目必須加強。

- **專業能力(Professional competencies，南非 Prof. Hu Hanrahan 提案，附件 4)**

「專業能力一覽表」詳述專業能力的各要素及其須全方位展現。(Professional competency profiles record elements of competency that must be demonstrated holistically)。愛爾蘭(IEI)和澳洲(EA)皆重視設計(design)的能力，也因此他們 Graduate Profiles 及 Professional Competence 上著重這一方面的核心能力。

近年來 Mobility Forum(「專業工程師流動性」)內的協定會員例如 EMF 跟 ETMF 因係關「國際專業工程師註冊」的事宜，對「能力鑑定」的問題相當關心。目前，EMF 跟 ETMF 將專業註冊(professional registration)、時間(time)、及所負責的專業經驗(responsible experience)納為考量的指標。這些組織(international registers) 必須定義一套「可評量」(assessable)的能力資格以協助各個協定提供未來國際工程師(engineers) 及國際技士(engineering technologists)能力導向註冊的管道(Agreements provide for a future competency-based route to international registers)。目前的「專業能力」(professional competence)標準有一些弱點 (limitations): 無規範性(not prescriptive)，且沒有對專業能力明確的指標以提供可評審的標準。

- **變遷的管理(Managing Change) (英國 Jim Birch 提案，附件 5)**

問題：目前「教育協定」(education accords) 的認可係依據認證制度的過程(process) 及資格(qualification) 是否符合實質相當來做核定，但若這些簽署協定組織因時間關係在標準上而有變化而與簽屬時有所差距時，該如何處理？

註：此項議題實際上已是學界、商業界紛紛討論及研究的議題，亦是許多時下暢銷書的主題。

- ABET 於此次大會上宣傳 ABET 2005 年的年會將著重於「成果導向評量」，因此對這項議題有興趣者須盡早報名。IEET 將組團前往。

- **Developing Pathway for Aspiring Countries to Signatory Status (南非 H. Hanarhan 提案，附件 6、7)**

近年來，許多 WA 會員組織皆紛紛對非會員但對認證有興趣的國家提出協助，因此，WA 也建議設立一套輔導非會員國家的系統，以便會員組織遵循並提供類似標準的協助。

另，對於現任會員 WA 也應有一案協助其擔任非會員組織顧問的工作，因此紐西蘭 IPENZ 提出草案以供討論(附件 8)。紐西蘭 IPENZ 也同時提出有關審查正式會員組織的草案(附件 9)。

註：美國與加拿大都已對墨西哥及中南美洲國家協助其建立認證制度。

- **國際論壇(International Forum/Conference/Symposium) (美國 ABET 的 G.**

## Peterson 提案)

所有的「教育協定」近期間正在考量共同舉辦一個國際論壇的可能性；這個論壇的目的在於提供大家分享最好的經驗(best practice)、合作機會(collaboration)及增進所有協定的「曝光率」(visibility)及外界對協定的了解與尊重。

註：IEET 也正在考量辦理類似論壇的可能性，目前可能透過 2006 年 1 月的「全國工程教育會議」先行以一個 track 的方式辦理，再於爾後考量擴大的可能性。未來於此會議上挑出的優秀論文可建議於 iNEER(International Network for Engineering Education and Research)的會議或國際工程教育會議(International Engineering Meetings)的教育協定(Educational Accords)會議發表。

\*大會主席宣布因教育協定的時間實在有限而須報告及討論的案件尚有許多，6 月 15 日的「正式會員」與「準會員」申請案將給予各申請組織僅 5~7 分鐘的時間做報告，1~2 分鐘的問答。對於申請組織來說，此項宣布實在有欠適當，因為大家於來到大會前皆被通知有 15~20 分鐘的時間，因此大家都已依規定準備好，對於突然的改變，勢必須做大幅度的修改。由此 WA 會議過程中的種種蹟象顯示此次大會議程上的安排及協調實在有些混亂。

## 6 月 15 日

- 新加坡的正式會員申請案並未於大會前提至議程，導致加拿大杯葛，明確表示對此案投棄權票，也因此新加坡成功的機率幾近 0，因為正式會員申請必

須獲得全數會員的支持。不論如何，新加坡還是得於大會上報告，但最後還是無法改變加拿大的決定。類似的情況也發生在印度的申請案。印度雖於大會上獲得報告的機會，且請會員組織將其列入優先考量的準會員申請案，但還是無法被列入決議。

- IEET 代表我國以 Chinese Taipei 申請 WA 準會員資格。
- 對於我國的申請案，會外多位人士對我國學制有很多的問題，尤其是針對二技轉四技的學生他們畢業後的能力如何能與四年制大學畢業生的能力相當，畢竟二技課程的方向與一般大學是不相同的。另外，加拿大(CCPE)對 EAC 委員的任期制度有一些考量，因為 EAC 委員應屬長期性以確保其決議的一致性。
- 胡文聰教授代表 IEET 在大會上報告。胡老師的報告簡潔清楚，並將 IEET 認證制度的重點以最明確的方式顯現，可算是所有申請案中最優秀的報告之一。WA 會員於胡老師報告完後僅問了二個問題。香港(HKIE)問 IEET 到底代表那個國家，而胡老師回答「如同 APEC Engineers，IEET 代表的是 Chinese Taipei 經濟體」。美國(ABET)問因此次 IEET 申請案中所呈現的受認證學系皆屬私立學校，是否下一個學年度的認證有國立學校的參與。胡老師肯定的答覆台大的機械系與土木系皆將申請認證。以上二問題的回答皆被提問者欣然接受。
- 經過冗長的討論，WA 會員組織終於對正式會員及準會員的申請案做出決議，通過的有日本的正式會員申請，我國及韓國的準會員申請。

- 美國(ABET)不是雪梨協定(Sydney Accord)或都柏林協定(Dublin)的會員,但他們於這二協定的會上以觀察原身份出席。目前此二協定皆積極勸說 ABET 加入他們的組織。

## 綜合心得

1. 新加坡今年未通過成為正式會員的經驗將是 IEET 的警示。據與新加坡代表團成員私下的討論,大會秘書處並無應新加坡的要求派遣審查員(reviewers),以致新加坡的申請案並沒有完成整個的手續。IEET 因此應於申請過程中額外小心,必須與大會秘書處(ABET)保持密切的聯絡,了解各項程序的細節,以確定完成整個申請手續。
2. 不知是大會秘書處的原因,或是其他原因,這次 Washington Accord 的大會非常沒有組織性,即便是大會主持人亦常常不確定會議進行的方式。這樣的情況顯示 WA 內部組織雖已成立多年但運作上尚不完善。
3. IEET 的努力的確是有所收穫,且立即將目標放在於 2007 年成為 WA 正式會員。IEET 須於會後以感謝函向 WA 會員國致意並寄恭賀信予日本。
4. 紐西蘭(IPENZ)的 Basil Wakelin 是我們的 mentor,但他提醒我國不應即刻於 2007 年提出正式會員的申請,因我們的制度尚有許多須改進的地方。
5. IEET 於會後應即時收集各個國家的認證制度細節,以更一步了解各國的制度,分析我國與他國間認證制度的相同與相異處,如此將幫助我國未來認證制度的改進及申請成為 WA 正式會員的機率。
6. 大多數國家認定美、加皆獨霸 WA,但此次會議展現其他國家皆非常積極參

與發言，其勢力與美加不勝上下。

7. 英國(ECUK)曾提案考慮廢除「正式會員」申請案必須由全體正式會員一致通過的決策，但此項提案並無被繼續討論。

## 建議事項

1. IEET 應於國內加強宣導有關 Washington Accord 組織及參與工程及科技教育認證的必要與益處。
2. IEET 應與 Washington Accord 會員保持密切交流以持續改進我國的認證制度及協助其對我國認證制度的瞭解。
3. IEET 應規劃以即早申請成為 Washington Accord 的正式會員。
4. 香港大會後的工作建議如下：

### **Roadmap\* for IEET to Attain Full Signatory (FS) Status in the Washington Accord**

(Draft – Version 1.0)

June 22, 2005

1. This roadmap is intended for IEET to submit application for full signatory in Jan. 2007. Realistically, we might be admitted as FS in 2009.
2. Action required – domestic
  - a. Understand (in some detail) criteria and procedures of WA signatories
  - b. Revised AC2004 and fine tune procedures
    - Incorporate comments from Alan and Basil
    - Use “Assessing Equivalence” in Section 5 of the document “Granting Provisional Admission and Signatory Status” as guideline.
  - c. Arrange WA signatories to observe on-site visits *and* EAC meeting
    - March-April (with Mentors observing)
    - Oct.-Nov. 2007 (with Reviewers observing, hopefully).

3. Action required – international
  - a. Write formal letter to all 8 Signatories thanking them of their support.
  - b. Write formal letter congratulating JABEE.
  - c. Write WA Secretariat to request Engineers Australia and IPENZ as our mentors.
  - d. Upon confirmation from the Secretariat of mentors, notify the mentors of our progress (revise AC2004 and procedures etc.) and solicit inputs from them. (Show our effort in continuous improvement.)
  - e. Attend ABET annual meeting, Oct. 27-28 in San Diego, where report on EC2000 by Penn State will be extensively discussed.
  - f. Fix dates for on-site visits + EAC meeting, and confirm with mentors ASAP.
  - g. Observe on-site visits (US, Canada, NZ, Ireland, HK)?
  
4. Important references from WA meeting in HK (pdf files)
  - a. Granting Provisional Admission and Signatory Status (drafted by EA)
  - b. International Accord Mentoring Guidelines (drafted by IPENZ)
  - c. Guidelines and Schedule of Rule Changes for Systematic Monitoring and Verification of Signatories including Small Nations (drafted by IPENZ)

\* This document is intended to simulate thoughts and discussions within IEET.



附件

## **1. Education Forum Schedule**

## **Education Forum**

### **June 13, 2005**

#### **Morning Session – Policy, Procedures, Guidelines**

<b>Schedule</b>	<b>Subject</b>	<b>Individual</b>	<b>Organization</b>	<b>Possible Action</b>
<b>09:00</b>	<b>Granting Provisional Admission / Signatory Status</b>	Maurice Allen	Engineers Australia	Recommendations to Business Meetings
	<b>Mentoring Guidelines</b>	Basil Wakelin	IPENZ	Rules/Procedure Revision
	<b>Monitoring / Review Visits</b>	Basil Wakelin	IPENZ	Rules/Procedure Revision
	<b>Distance Delivery/ Programs Delivered Across National Boundaries</b>	Alan Bradley	Engineers Australia	Rules/Procedure Revision
<b>10:45 –11:00</b>	<b>BREAK</b>			
<b>11:00</b>	<b>Professional Secretariat Proposal</b>	Kathryn Aberle	ABET, Inc.	Recommendations to Business Meetings
	<b>Graduate Attributes / Professional Competencies</b>	Hu Hanrahan	ECSA	Recommendations to Business Meetings
<b>12:45</b>	<b>LUNCH</b>			

## **Education Forum June 13, 2005**

### **Afternoon Session - Emerging Issues, Opportunities and Information**

Schedule	Subject	Individual	Organization	Comments/ Action
13:45	<b>Managing Changing Standards</b>	Jim Birch	EC <sup>UK</sup>	General Discussion
	Outcomes Based Assessment	George Peterson	ABET, Inc.	Sharing Experiences / Best Practices
	<b>Developmental Pathways / Countries Aspiring to Signatory Status</b>	Hu Hanrahan	ECSA	General Discussion
15:30– 15:45	BREAK			
	International Education Forum / Conference / Symposium	George Peterson	ABET, Inc.	Potential All Accords Education Conference

### **Information and Feedback from Other Organizations/Projects**

Schedule	Subject	Individual	Organization	Comments
15:45	FEANI	Duarte Silva	FEANI	Information
	The EUR-ACE Project	Iring Wasser	ASIIN	Information
	<b>World Federation of Engineering Societies (WFEO)</b>	Dato Lee Yee-Cheong	WFEO	<b>Recent Activities and Speeches</b>
17:00	Summary / Wrap Up			

附件

**2. Washington Accord Working Party  
on Distance Delivery and Delivery  
Across National Boundaries**

# WASHINGTON ACCORD

Submission to the International Engineering Meetings Workshops  
Hong Kong 13-17 June, 2005

## PROGRESS REPORT

### *Washington Accord Working Party on Distance Delivery and Delivery Across National Boundaries*

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#### 1 BACKGROUND

At the Washington Accord meeting of signatories in June 2003 in Rotorua, New Zealand, a Working Party was commissioned to consider issues for the Accord associated with the delivery of engineering education programs across national boundaries and also delivery by distance mode.

Nominations for the Working party included representatives of Engineers Australia, HKIE, ABET and ECSA with Engineers Australia fulfilling the role of Chair.

Representatives who have participated in the Working Party to date are as follows:

- Engineers Australia – Alan Bradley,
- HKIE – Albert Chow (and more recently also, Kenneth Hsu – Deputy Chairman HKIE Accreditation Board),
- ABET – (initially Fred Emshousen) and more recently Kate Aberle and George Peterson,
- ECSA – Hu Hanrahan,
- CCPE – Deborah Wolfe (by invitation to contribute to Working party activities in 2005).

#### 2 WORKING PARTY MEETINGS AND OUTCOMES

**MAY 2004 TELE-CONFERENCE:** The first meeting of the Working Party was by international tele-conference on 21 May, 2004. At this meeting the emergence of a potential continuum of flexible delivery approaches was explored. The issues of collaboration between signatories, possible bi-lateral agreements and the need to satisfy statutory requirements were discussed in relation to educational delivery across national boundaries. Key matters were listed for further discussion at the Workshop to be held in London in June, 2004.

**JUNE 2004 LONDON WORKSHOP:** The Working Party led a discussion forum at the London Workshop resulting in the Recommendation Paper – ‘Programs Delivered by Distance and Programs Delivered across National Boundaries’. This paper included for consideration a recommendation for an addition to the Washington Accord - Rules and Procedures to clarify accreditation responsibilities where a program is implemented by a provider outside of the national or territorial boundary of the host signatory.

Subsequent to the Workshop, comments were received from various signatories on the appropriateness of this recommendation. The concept of interpreting the ‘location of delivery’ to be within the national boundary of the host signatory under the circumstances of an ‘undifferentiated’ international program offering was broadly accepted by respondents. There were numerous suggestions however which assisted the Working Party in its subsequent efforts to consolidate and clarify the recommendation.

**MAY 2005 TELE-CONFERENCE:** (DRAFT MEETING RECORD) On 11 May, 2005, the Working Party again met by tele-conference. At this meeting the London outcome recommendation paper on Delivery across National Boundaries was reconsidered in detail, and with particular reference to the individual written feedback reports received from ECUK, CCPE, IEI, IPEJ, HKIE and BEM. A draft of a revised recommendation paper was discussed in detail. This draft was subsequently reiterated through email correspondence and finalised for

submission as a formal proposal for the meeting of signatories in Hong Kong in June, 2005. Particular attention has been paid in this proposal document to clarifying the meaning of an undifferentiated offering, emphasising the need for collaboration between signatories, clarifying the issues of a joint accreditation process as well as the need to satisfy the statutory requirements of the country in which international delivery is to occur.

On the issue of Distance Delivery, the Working Party members compared experiences and developments within their respective jurisdictions. The Working Party acknowledged the blurring of boundaries that is occurring as flexible delivery opportunities emerge through mechanisms such as the mobility of students across branch campuses, study abroad options, workplace learning elements and the utilisation of e-learning or 'distance mode' resources.

At one extreme is the possibility of an engineering education program being offered entirely by distance mode, using electronic learning resources and communication technologies. Although there were no examples reported of accredited programs delivered exclusively in distance mode, there is activity in the United States towards the development of an Electrical Engineering program that would potentially be delivered in this way.

Engineers Australia has accredited, in two separate universities, professional engineering programs that are based on a 'distance delivery' mode. The 'distance delivery' offering is an alternative implementation of a host program already established on the home campus and offered in traditional mode. In each of these cases, students are required to participate in regular on-campus activities, which include laboratory and practical learning, project activity, team work, interaction with the 'on-campus' student cohort, oral presentations and exposure to professional engineering practice. Because of the home campus attendance requirement, the delivery of these programs was seen to be of a hybrid nature, rather than classified as pure distance mode.

The Working Party considered draft guidelines developed by Engineers Australia as a basis for managing the accreditation of programs offered in 'distance mode'. These guidelines are pertinent to the circumstances of delivery currently endorsed by the Engineers Australia Accreditation Board. They were seen to be too restrictive however to form a basis of a universal framework, accommodating the range of emerging possibilities that will inevitably be faced by the Washington Accord. The Working Party will continue to monitor developments experienced by the various signatories and make recommendations as appropriate to the Accord.

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# WASHINGTON ACCORD

Submission to the International Engineering Meetings Workshops

Hong Kong 13-17 June, 2005

## Programs Delivered Across National Boundaries

*A paper prepared by the Washington Accord Working Party on Distance Delivery and Delivery Across National Boundaries*

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### 1 BACKGROUND

Clause 3 of the Washington Accord states: *The Accord applies only to accreditations conducted by the signatories within their respective national or territorial boundaries.*

There is an emerging trend for engineering schools to offer flexible delivery options, alternative study pathways and alternative implementations of an existing program beyond traditional on-campus delivery. Study pathways could for example involve distance learning elements, optional workplace learning components or the mobility of students between alternative campuses of an institution. A host program established and accredited for traditional delivery on a provider's headquarters campus could be alternatively implemented at a branch campus or at a partner institution. There is potential in all of these cases for delivery to occur outside the national boundaries of the country in which the headquarters of the provider is located.

This raises an issue for signatories operating under the Washington Accord. In order to ensure the integrity of educational outcomes, it would be necessary for a signatory to undertake accreditation activities beyond its national or territorial boundaries when an educational provider, headquartered within its jurisdiction, offers learning elements, or alternative program implementations at international locations.

### 2 THE DILEMMA OF AN UNDIFFERENTIATED IMPLEMENTATION

Where a host program, established on the headquarters campus of a provider, is alternatively implemented on a branch campus or through a partner institution, the issue of differentiation arises. An **undifferentiated** implementation would normally be classified as follows.

- The integrity of the alternative implementation of the program must be founded on the basis that the same educational outcomes are delivered at each location of implementation.
- The structure and content of the host and alternative program implementations must be equivalent to the extent that mobility of students between campuses would be feasible.
- The degree certificates or testamurs do not distinguish the location(s) of delivery.
- Host and alternative implementations of a program must each separately and continuously satisfy the accreditation criteria set by the accrediting body for the headquarters country, if the program as a whole is to retain accreditation.

An existing example is where a host provider establishes a partnership with an organisation in another country, to offer at this international location, an undifferentiated implementation of a program already being delivered in traditional mode on the headquarters campus of the provider. Delivery may well involve the provider's academic staff team travelling to the international location to provide face to face delivery, as well as the use of local staff members, facilities and services of the partner organisation.

The signatory responsible for accreditation in the country of the host provider needs to evaluate implementations of the program both at the headquarters campus as well as at the international location in order to ensure the equivalence of educational outcomes and full compliance with the accreditation criteria. Accreditation of the headquarters campus implementation is thus at risk if the international implementation does not separately satisfy these requirements.

A dilemma arises because Clause 3 implies that accreditation of the program would not be recognised under the Accord, because the signatory has undertaken accreditation beyond its national or territorial boundaries.

In order to resolve this dilemma, when program implementations cross national boundaries, the following addition to the rules and procedures of the Accord is proposed.

### **3 PROPOSED ADDITION TO THE RULES AND PROCEDURES OF THE ACCORD**

The issue of accreditation of programs offered across national boundaries has been considered by tele-conference meetings of the Washington Accord Working Party on Distance Delivery and Delivery Across National Boundaries commissioned at the 2003 meeting of signatories in Rotorua, New Zealand. The matter was considered in further detail at the IEM Workshop held in London in June of 2004. The addition to the rules and procedures of the Accord was first proposed at the 2004 Workshop and subsequently refined (in response to feedback from signatories, and in particular IEI) by the Working Party at a tele-conference meeting on 11 May, 2005. Subsequent feedback from a range of signatories expressed support for the proposed addition to the rules and procedures.

#### **PROPOSED ADDITION TO RULES AND PROCEDURES**

***Where an engineering program is alternatively implemented by a provider at a location outside its national or territorial boundary, the 'location' of the program, irrespective of its mode of delivery, shall for the purposes of the Accord, be deemed to be within the national or territorial boundary of the provider.***

#### ***Explanatory notes:***

- ***In the case of a provider offering an undifferentiated implementation of an established program at an international location, responsibility for accreditation would thus normally rest with the signatory of the country in which the provider is headquartered.***
- ***Where the location for the alternative implementation of the host program is within the national or territorial boundaries of a second signatory to the Accord, then it would be expected that the accreditation process be conducted on a collaborative basis. The alternative implementation should satisfy the accreditation requirements and criteria of both signatories. Collaboration would open the opportunity for accreditation on a joint basis and foster dialogue on the conduct and implementation of the visit.***
- ***In every instance the signatory associated with the host provider must ensure that the implementation of the program will fully comply with all statutory and regulatory requirements of the country in which international delivery is to occur.***

### **4 THE CASE FOR A DIFFERENTIATED, INTERNATIONAL OFFERING**

An established provider could introduce a new program, offered solely through a branch campus or partner institution located in another country. In this case the program is not an alternative implementation of a program already established on the provider's headquarters campus, and would thus be classified as a differentiated offering. Under these circumstances accreditation of the international offering would carry no implication for programs offered by the provider at its headquarters campus.

Where the location of the international offering happens to be within the national boundaries of a second signatory to the Washington Accord, then this signatory could carry primary responsibility for accreditation under the Accord. Such accreditation would however be expected to be in collaboration with the signatory of the jurisdiction in which the provider is headquartered. Again the program offering should satisfy the accreditation requirements and criteria of both signatories.



附件

### **3. Professional Secretariat Proposal**

# PROFESSIONAL SECRETARIAT PROPOSAL

Recommendation of the Secretariat Task Group

June 2005

## **RECOMMENDATION:**

The Secretariat Task Group proposes the establishment of a professional secretariat to support the Washington Accord with the option of providing future support to other mutual recognition or professional mobility agreements that currently participate in the International Engineering Meetings. Approval of the establishment of a professional secretariat would require the following amendments to Washington Accord Rules of Procedure:

### 4. CHAIR AND SECRETARY

*At the conclusion of each general meeting, a signatory shall be appointed by signatories to provide the Chair, and the person nominated by that signatory shall hold office until the conclusion of the next succeeding general meeting. No signatory which has nominated the Chair for one period between general meetings shall be responsible for nominating the Chair for the next such period.*

*Similarly, a signatory shall be appointed as Secretary. The Secretary will serve as Deputy Chair. The Chair and Secretary shall normally come from different signatories.*

### 5. SECRETARIAT

*5.1 At each general meeting, the signatories shall consider proposals from signatories who wish to provide the secretariat for the following four years and make the appointment. At the conclusion of each general meeting, a signatory shall be appointed by the signatories to provide the secretariat. Signatories wishing to serve as secretariat will make a proposal to the signatories for a term of four years, renewable for an additional two years.*

*5.2 The Chair and the secretariat shall normally come from different signatories.*

*5.3 The secretariat shall maintain a record of the deliberations and decisions at each general meeting, shall facilitate and record exchanges of information between the signatories, and shall seek to advise signatories and others as to the policies and procedures to be adopted to give effect to the terms of the Accord. In addition, the secretariat shall maintain all official records and historical documents of the Accord, provide general information on the Accord, offer guidance in the signatory application process and facilitate the implementation of monitoring and mentoring activities.*

*5.4 Financial support for the secretariat shall come from an annual assessment of each of the signatories, based on a fee schedule decided by the signatories.*

*5.5 Periodically, a committee of the signatories will provide a review the performance of the secretariat.*

5.6 *At its option, the Accord may choose to join with other related agreements to use the services of a Professional Secretariat.*

## 2. *ADMISSION OF NEW SIGNATORIES*

2.1 *Applications for provisional status must conform to the guidelines approved from time to time by the signatories and must be submitted in writing to the secretariat, supported by nominations from at least two of the signatories, and accompanied by an application fee established by the signatories. Acceptance to provisional status requires a positive vote by two-thirds of the signatories.*

2.5 *Organizations holding provisional status are required to accept the same commitment to interaction and exchange as the signatories. They will receive copies of appropriate correspondence and reports, and will be invited to send representatives to all general meetings of the signatories. Representatives of organizations holding provisional status will have the right of audience and debate at such general meetings, but are not permitted to vote. Provisional signatories will be assessed an annual fee established by the signatories.*

### **BACKGROUND:**

1. Since its establishment in 1989, the Washington Accord has operated with a voluntary secretariat, elected by the signatories. The other mutual recognition and mobility agreements have followed the same procedure. The responsibility and related costs associated with providing the secretariat have rotated among the various signatories.
2. Greater visibility and interest in the Accord has led to a greater commitment of time and resources by the designated signatory to support the activities of the secretariat.
3. The signatories have expanded their expectations of the role of the secretariat as have the procedures and processes for mentoring and monitoring potential, provisional, and existing signatories.
4. As the Accord has grown, there are only a few signatories with the capacity to assume the responsibilities of secretariat.
5. At the June 2003 meeting of the Washington Accord and at the plenary session of the International Engineering Meeting in Rotorua, New Zealand, participants discussed the need for a permanent secretariat for one or all of the agreements. A task group volunteered to examine the issues at a workshop in June 2004 and bring a recommendation to the signatories at the June 2005 meeting in Hong Kong. The task group was comprised of Engineers Australia, Canadian Council of Professional Engineers, Engineers Council UK, the Institution of Engineers Malaysia, the Canadian Council of Technicians and Technologists, and ABET (Chair).
6. The task group met in London in June 2004, and discussed the issues, the role of the secretariat, possible alternatives and selection criteria. Two primary issues were identified: “The increased responsibilities of the Secretariat require more continuity than is provided with a two-year term,” and “The financial and personnel costs associated with the Secretariat prohibit some signatories from service.”

There was considerable discussion of the role of the secretariat, and the participants were clear that although some of the secretariat's responsibilities were increasing, the intent was not to create an Accord Executive and that the primary responsibility for the Accord would rest with the signatories. The primary responsibility of the secretariat is to provide "organizational memory" through the maintenance of official records of the Accord, including, but not limited to, the original agreement and rules of procedure, minutes, membership applications and monitoring reports. The secretariat is also responsible for dissemination of the agenda for meetings and workshops, and for recording and disseminating meeting minutes. The secretariat is expected to respond to inquiries from signatories, potential signatories, graduates, employers, accrediting organizations, government agencies and higher education entities in a timely manner, and to forward issues and concerns to the chair or signatories for discussion or action. To facilitate dissemination to the signatories and the public, the secretariat will maintain the Accord website. Finally, the secretariat is responsible for implementation of approved policies and procedures, such as development of the monitoring visit schedule and coordination of monitoring visit teams and mentoring activities.

The task group identified several possible alternatives to address administration of the Accord, but finally limited their discussion to 3 options:

- Professional secretariat for all agreements
- Professional secretariat for education agreements and Professional secretariat for mobility agreement
- Professional secretariat for engineering agreements and Professional secretariat for technology agreements

The task group came to following conclusions:

1. A rotating, voluntary secretariat is an effective way for beginning organizations to develop leadership and trust among signatories.
2. Efficiencies could be gained by having a single, Professional secretariat.
3. All agreements may not have sufficient administrative responsibilities to require a professional secretariat.
4. Development of separate professional secretariats could make it difficult for the agreements to merge under a single secretariat in the future.
5. The Washington Accord is ready to consider a professional secretariat.
6. A professional secretariat for the Washington Accord should be developed with the provision that other agreements could join in the future.
7. The secretariat would be maintained within one of the signatories. The level of knowledge required to respond to inquiries precludes the use of independent contractors and professional management companies.
8. The secretariat is not the chief executive of the Accord. The signatories will decide representation of the agreement at outside international meetings.
9. The costs associated with the secretariat should be borne fairly by each signatory. Non-payment of fees within a specified time frame would constitute grounds for removal from the agreement. Provisional members should pay an application fee and an annual fee.

10. The funding scheme presented will provide a provision for additional agreements to participate. Non-payment of fees may result in loss of recognition, after a suitable warning period.
11. The cost of the secretariat to the signatories could be:
  - A flat fee
  - A stepped fee with a cap based on number of agreements, programs and registry entries (*Example with the Education Accords: \$XX per agreement and \$YY for 1-100 programs, \$ZZ for 101-250 programs, \$AA for 251+ programs accredited on January 1 of each year*). In the event mobility agreements are served by the Professional secretariat, individuals who are registered in more than one country will be considered in the count for each country.
  - A formula (*including a cap*)
    - The annual fee should be calculated based on the total estimated budget divided by the number of units. The following units are suggested:
    - Accords: 10 units per accredited programme  
500 units per membership of each agreement
    - Mobility Agreements:  
1 unit per entry in register  
500 units per membership of an agreement

The task group agreed that a stepped fee with a ceiling cap was the most equitable structure. The current cost for providing the Washington Accord secretariat is approximately US\$75,000.

12. Signatories will be permitted to “bid” for the secretariat. Secretariat will be selected/elected by signatories. A contract for 4 years and renewable for an additional 2-years is proposed. A performance review will be completed prior to renewal. All full signatories to an agreement served by the secretariat will be eligible to “bid” for secretariat.
13. The secretariat will be accountable to the signatories. Should additional agreements wish to engage the services of the secretariat (a Professional secretariat), a secretariat management committee consisting of the Chairs and Secretaries of the participating agreements will be established and will be responsible for reviewing the performance of the Professional Secretariat. In addition, each agreement may appoint a Secretary to deal with operational matters and to contribute to the deliberations at international meetings and workshops. The Secretary would serve without recompense.

**PROFESSIONAL SECRETARIAT**  
*DRAFT FOR DISCUSSION*

**1.0 Professional Secretariat Cooperation**

Engineering-related accords and agreements may seek to be administered through the Professional Secretariat. Approval by the current signatories of the accords or agreements currently administered by the Professional Secretariat must be secured. The Secretary for each accord or agreement will be responsible for coordination with the Professional Secretariat.

**1.1 Professional Secretariat Oversight**

The Professional Secretariat Committee, composed of the chairs and secretaries of each accord and agreement, will provide oversight of the Professional Secretariat. The chair of the committee will be elected by the members of the committee. The Professional Secretariat Committee will be responsible for the periodic review of the Professional Secretariat.

**1.2 Professional Secretariat Terms of Service**

The Professional Secretariat will serve for four years, renewable for an additional two years, at which time the Professional Secretariat may bid again.

**1.3 Responsibilities of the Professional Secretariat**

The Professional Secretariat shall maintain all official records and historical documents of the accords and agreements, provide general information on the accords and agreements, shall offer guidance to organizations seeking signatory status, advise signatories and others as to the policies and procedures of the accords and agreements, and facilitate the implementation of monitoring and mentoring activities.

The Professional Secretariat shall work with the secretary of each accord and agreement in the preparation of agendas and minutes of meetings. The Professional Secretariat shall be responsible for the dissemination of accord and agreement information through the maintenance of a website and through other appropriate means.

The Professional Secretariat is not the chief executive of the agreements and accords. The signatories will decide on the appropriate representative of their accord or agreement at outside international meetings.

**2.0 Rationale of Financial Plan**

2.1 The cost of the Professional Secretariat shall be borne by the signatories. Provisional signatories and applicants to signatory status shall also support the cost of the Professional Secretariat.

2.2 The assessment to each signatory will be based on the number of agreements to which each organization is a signatory, the number of programs accredited by the signatory and recognized under the agreements and the number of registry entries. Signatories that participate in more than one accord or agreement shall pay for participation in each

agreement. Likewise, individuals who are registered in more than one signatory jurisdiction or country will be considered in the count for each signatory.

### **3.0 Fiscal Year**

3.1 The fiscal year for the Professional Secretariat shall be from January 1 through December 31.

### **4.0 Assessments**

4.1 Each signatory shall be assessed a fee for the support of the Professional Secretariat. The signatories at their general meeting will approve the assessment schedule. The signatories' assessment will have 2 components: a base assessment and an accredited program assessment.

4.2 One-half of the proposed operating costs of the Professional Secretariat will be shared equally by each signatory to each agreement. This fee shall constitute the Base Assessment.

4.3 Provisional Signatories will pay a rate equal to 50% of the Base Assessment. In addition, Provisional Signatories will pay all costs associated with mentoring and verification visits by the signatories.

4.4 One-half of the proposed operating costs of the Professional Secretariat will be based on a stepped scale. This shall constitute the Program Assessment. Signatories with 1-100 accredited programs will pay a flat program assessment that is 50% of that paid by signatories with 101-250 accredited programs. Signatories with more than 250 accredited programs will pay a flat program assessment equal of 150% of that paid by signatories with 101-250 accredited programs. Because provisional signatories have no recognized programs, they will not pay the Program Assessment. Upon approval of full signatory status to any of the agreements, provisional signatories will pay the Basic and Program Assessments, prorated from date of admission as a full signatory.

### **5.0 Application Fees**

Organizations seeking membership in an accord or agreement must pay an application fee. The application fee must accompany each application to each accord or agreement. The application fee is equal to 25% of the Base Assessment. In addition, applicants are responsible for all costs associated with familiarization and mentoring visits.

### **6.0 Non-Payment of Assessments or Fees**

Non-payment of an assessment or fee within 60 days may result in the loss of recognition and may constitute grounds for removal from the accord or agreement.

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## **4. Graduate Attributes and Professional Competencies**



# **Graduate Attributes and Professional Competencies**

## **Working Paper for IEM 2005**

**Ver 1 - 13 May 2005**

### **Executive Summary**

Several accrediting bodies for engineering qualifications have developed outcomes-based criteria for evaluating programmes. Similarly, a number of engineering regulatory bodies have developed or are in the process of developing competency-based standards for registration. Educational and professional accords for mutual recognition of qualifications and registration have developed statements of graduate attributes and professional competency profiles. This paper presents the background to these developments, their purpose and the methodology and limitations of the statements. After defining general range statements that allow the competencies of the different categories to be distinguished, the paper presents the graduate attributes and professional competency profiles for three professional tracks: engineer, engineering technologist and engineering technician.

## **1 Introduction**

Engineering is an activity that is essential to both economic development and the provision of services to society. Typical engineering activity requires several roles including those of the engineer, engineering technologist and engineering technician, recognized as professional registration categories in many jurisdictions<sup>1</sup>. These roles are defined by their distinctive competencies, with a degree of overlap between roles.

The development of an engineering professional in any of the categories is an ongoing process with important identified stages. The first stage is the attainment of an *accredited educational qualification*, the graduate stage. The second stage, following after a period of training and experience, is *professional registration*. For engineers and engineering technologists, a third milestone is to qualify for the *international register* held by the various jurisdictions. In addition, engineers, technologists and technicians are expected to maintain and enhance competency throughout their working lives.

Several international accords provide for recognition of graduates of accredited programmes of each signatory by the remaining signatories. The Washington Accord (WA) provides for mutual recognition of programmes accredited for the engineer track. The Sydney Accord (SA) establishes mutual recognition of accredited qualifications for engineering technologist. The Dublin Accord (DA) provides for mutual recognition of accredited qualifications for engineering technicians. These accords are based on the principle of substantial equivalence rather than exact correspondence of content and outcomes. This document records the signatories' consensus on the attributes of graduates for each accord.

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<sup>1</sup> The terminology used in this document uses the term *engineering* as an activity in a broad sense and *engineer* as shorthand for the various types of professional and chartered engineer. It is recognized that *engineers*, *engineering technologists* and *engineering technicians* may have specific titles or designations and differing legal empowerment or restrictions within individual jurisdictions.

Similarly, the Engineers Mobility Forum (EMF) and the Engineering Technologists Mobility Forum (ETMF) provide mechanisms to support the recognition of a professional registered in one signatory jurisdiction obtaining recognition in another. The signatories have formulated consensus competency profiles for the international registers and these are recorded in this document. While no mobility forum exists for technicians, competency statements were also developed for technicians for the sake of completeness.

Section 2 sketches the origin and steps in developing the graduate attributes and professional competency profiles. Section 3 give the background to the graduate attributes presented in section 7. Section 4 provides background to the professional competency profiles presented in section 8. Section 5 provides a number of definitions. General range statements are presented in section 6.

## **2 Origin of Graduate Attribute and Professional Competency Profiles**

The signatories to the Washington Accord recognized the need to describe the attributes of a graduate of a Washington Accord accredited program. Work was initiated at its June 2001 meeting held at Thornybush, South Africa. At the International Engineering Meetings (IEM) held in June 2003 at Rotorua, New Zealand, the signatories to the Sydney Accord and the Dublin Accord recognized similar needs. The need was recognized to distinguish the attributes of graduates of each type of programme to ensure fitness for their respective purposes.

The Engineers Mobility Forum (EMF) and Engineering Technologist Mobility Forum (ETMF) have created international registers in each jurisdiction with current admission requirements based on registration, experience and responsibility carried. The mobility agreements recognize the future possibility of competency-based assessment for admission to an international register. At the 2003 Rotorua meetings, the mobility fora recognized that many jurisdictions are in the process of developing and adopting competency standards for professional registration. The EMF and the ETMF therefore resolved to define assessable sets of competencies for engineer and technologist. While no comparable mobility agreement exists for technicians, the development of a corresponding set of standards for engineering technicians was felt to be important to have a complete description of the competencies of the engineering team.

A single process was therefore agreed to develop the three sets of graduate attributes and three professional competency profiles. An International Engineering Workshop (IEWS) was held by the three educational accord and the two mobility fora in London in June 2004 to develop statements of Graduate Attributes and International Register Professional Competency Profiles for the Engineer, Engineering Technologist and Engineering Technician categories. The resulting statements were then opened for comment by the signatories. The comments received called for minor changes only. The graduate attributes are presented in section 7 while the professional competency profiles are in section 8.

## **3 Graduate Attributes**

### **3.1 Purpose of Graduate Attributes**

*Graduate attributes* form a set of individually assessable outcomes that are the components indicative of the graduate's potential competency. The graduate attributes are exemplars of the attributes expected of graduate from an accredited programme. Graduate attributes are clear, succinct statements of the expected capability, qualified if necessary by a range indication appropriate to the type of programme.

The graduate attributes are intended to assist Signatories and Provisional Members to develop outcomes-based accreditation criteria for use their respective jurisdictions. Also, the graduate attributes guide bodies developing their accreditation systems with a view to seeking signatory status.

Graduate attributes are defined for educational qualifications in the engineer, engineering technologist and engineering technician tracks. The graduate attributes serve to identify the distinctive characteristics as well as areas of commonality between the expected outcomes of the different types of programmes.

### 3.2 Limitation of Graduate Attributes

Each signatory defines the standards for the relevant track (engineer, technologist or technician) against which engineering educational programmes are accredited. Each educational level accord is based on the principle of *substantial equivalence*, that is, programmes are not expected to have identical outcomes and content but rather produce graduates who could enter employment and be fit to undertake a programme of training and experience leading to professional registration. The graduate attributes provide a point of reference for bodies to describe the outcomes of substantially equivalent qualification. The graduate attributes do not constitute an “international standard” for accredited qualifications.

The term graduate does not imply a particular type of qualification but rather the exit level of the qualification, be it a degree or diploma.

### 3.3 Scope and Organisation of Graduate Attributes

The graduate attributes are organized using thirteen headings shown in section 7. Each heading lists the factor that allows the distinctive roles of engineers, technologists and technicians to be distinguished by range information.

For each attribute, statements are formulated for engineer, technologist and technician using a common stem, with ranging information appropriate to each educational track. For example, for the **Knowledge of Engineering Sciences** attribute:

**Common Stem:** Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization ...

**Engineer Range:** ... to the conceptualization of engineering models

**Engineering Technologist Range:** ... to defined and applied engineering procedures, processes, systems or methodologies.

**Engineering Technician Range:** ... to wide practical procedures and practices.

The resulting statements are shown below for this example:

... for Washington Accord Graduate	... for Sydney Accord Graduate	... for Dublin Accord Graduate
Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the conceptualization of engineering models.	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.

The range qualifier in several attribute statements uses the notions of *complex engineering problems*, *broadly-defined engineering problems* and *well-defined engineering problems*. These shorthand level descriptors are defined in section 6.

The full set of graduate attribute definitions are given in section 7.

### 3.4 Contextual Interpretation

The graduate attributes are stated generically and are applicable to all engineering disciplines. In interpreting the statements within a disciplinary context, individual statements may be amplified and given particular emphasis but must not be altered in substance or individual elements ignored.

## 4 Professional Competency Profiles

### 4.1 Purpose of Professional Competency Profiles

A professionally or occupationally *competent person* has the attributes necessary to perform the activities within the profession or occupation to the standards expected in employment or practice. The *professional competency profiles* for each professional category record the elements of competency necessary for competent performance that the professional is expected to be able to demonstrate in a holistic way.

Professional competence can be described using a set of attributes corresponding largely to the graduate attributes, but with different emphases. For example, at the professional level, the ability to take responsibility in a real-life situation is essential. Unlike the graduate attributes, professional competence is more than a set of attributes that can be demonstrated individually. Rather, competence must be assessed holistically.

### 4.2 Scope and Organisation of Professional Competency Profiles

The professional competency profiles are written for each of the three categories: engineer, engineering technologist and engineering technician. Each profile consists of thirteen elements. Individual elements are formulated around a differentiating characteristic using a stem and modifier, similarly to the method used for the graduate attributes described in section 3.3.

The stems are common to all three categories and the range modifiers allow distinctions and commonalities between categories to be identified. Like their counterparts in the graduate attributes, the range statements use the notions of complex engineering problems, broadly-defined engineering problems and well-defined engineering problems defined in section 6.1. At the professional level, a classification of engineering activities is used to define ranges and to distinguish between categories. Engineering activities are classified as *complex*, *well-defined* or *broadly-defined*. These shorthand level descriptors are defined in section 6.2.

### 4.3 Limitations of Professional Competency Profile

As in the case of the graduate attributes, the professional competency profiles are not prescriptive in detail but rather reflect the essential elements that would be present in competency standards.

The professional competency profiles do not specify performance indicators or how the above items should be interpreted in assessing evidence of competence from different areas of practice or for different types of work. Section 4.4 examines contextual interpretation.

Each jurisdiction may define **performance indicators**, that is actions on the part of the candidate that demonstrate competence. For example, a design competency may be evidenced by the following performances:

- 1: *Identify and analyse design/ planning requirement and draw up detailed requirements specification*
- 2: *Synthesise a range of potential solutions to problem or approaches to project execution*
- 3: *Evaluate the potential approaches against requirements and impacts outside requirements*
- 4: *Fully develop design of selected option*
- 5: *Produce design documentation for implementation*

#### 4.4 Contextual Interpretation

Demonstration of competence may take place in different areas of practice and different types of work. Competence statements are therefore discipline-independent. Competence statements accommodate different types of work, for example design, research and development and engineering management by using the broad phases in the cycle of engineering activity: problem analysis, synthesis, implementation, operation and evaluation, together the management attributes needed. The competence statements include the personal attributes needed for competent performance irrespective of specific local requirements: communication, ethical practice, judgement, taking responsibility and the protection of society.

The professional competency profiles are stated generically and are applicable to all engineering disciplines. The application of a competency profile may require amplification in different regulatory, disciplinary, occupational or environmental contexts. In interpreting the statements within a particular context, individual statements may be amplified and given particular emphasis but must not be altered in substance or ignored.

### 5 Definitions

The **practice area** of a professional engineer, engineering technologist or engineering technician is defined by both the area in which he or she holds engineering knowledge and the nature of the activities performed.

**Engineering Problem:** is one that exists in any domain that can be solved by the application of engineering knowledge and skills and generic competencies.

**Solution:** means an effective proposal for resolving a problem, taking into account all relevant technical, legal, social, cultural, economic and environmental issues and having regard to the need for sustainability.

**Manage:** means managing in respect of risk, project, change, financial, compliance, quality, ongoing monitoring, control and evaluation.

## 6 Common Range and Contextual Definitions

### 6.1 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 and having some or all of the following characteristics:	Engineering problems having some or all of 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 in-depth knowledge that allows a fundamentals-based first principles analytical approach	Requires knowledge of principles and applied procedures or methodologies	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; <u>context may be unfamiliar</u>	Are frequently encountered and thus familiar to most practitioners in the practice area; <u>context may be unfamiliar</u>
6	Level of problem	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 possibly including many component parts or sub-problems	Are parts of, or systems within complex engineering problems	Are discrete components of engineering systems
	<u>Requirement identification</u>		<u>Identification of a requirement or the cause of a problem identifiable by well proven ways</u>	<u>Identification of a requirement or the cause of a problem identifiable by well proven ways</u>

Note: Underlined text added as result of comment after London Workshop.

## 6.2 Range of Engineering Activities

	Attribute	Complex Activities	Broadly-defined Activities	Well-defined Activities
1	Preamble	<b>Complex activities</b> means ( <i>engineering</i> ) activities or projects that have some or all of the following characteristics:	<b>Broadly defined activities</b> means ( <i>engineering</i> ) activities or projects that have some or all of the following characteristics:	<b>Well-defined activities</b> means ( <i>engineering</i> ) 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, informaion 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 of knowledge of engineering principles in novel ways.	Involve the use of new materials, techniques or processes in innovative ways	Involve the use of existing materials techniques, or processes in new ways
5	Consequences to society and the environment	Have significant consequences in a range of contexts	Have 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 procederes and practices for widely-applied operations and processes

## 7 Graduate Attribute profiles

The following table provides profiles of graduates of three types of tertiary education engineering programmes. See section 6 for definitions of complex engineering problems, broadly-defined engineering problems and well-defined engineering problems.

		Differentiating Characteristic	... for Washington Accord Graduate	... for Sydney Accord Graduate	... for Dublin Accord Graduate
1.	Academic Education	Educational depth and breadth	Completion of an accredited program of study typified by four years or more of post-secondary study.	Completion of an accredited program of study typified by three years or more of post-secondary study.	Completion of an accredited program of study typified by two years or more of post-secondary study.
2.	Knowledge of Engineering Sciences	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 conceptualization of engineering models.	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.
3.	Problem Analysis	Complexity of analysis	Identify, formulate, research literature and solve <i>complex</i> engineering problems reaching substantiated conclusions using first principles of mathematics and engineering sciences.	Identify, formulate, research literature and solve <i>broadly-defined</i> engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation.	Identify and solve <i>well-defined</i> engineering problems reaching substantiated conclusions using codified methods of analysis specific to their field of activity.
4.	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 <i>complex</i> engineering problems and <i>design</i> systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.	Design solutions for <i>broadly-defined</i> engineering technology problems and <i>contribute to</i> 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 <i>well-defined</i> technical problems and <i>assist with</i> the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
5.	Investigation	Breadth and depth of investigation and experimentation	Conduct investigations of <i>complex</i> problems including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.	Conduct investigations of <i>broadly-defined</i> problems; locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions.	Conduct investigations of <i>well-defined</i> problems; locate and search relevant codes and catalogues, conduct standard tests and measurements.
6.	Modern Tool Usage	Level of understanding of the appropriateness of the	Create, select and apply appropriate techniques, resources, and modern	Select and apply appropriate techniques, resources, and modern engineering tools,	Apply appropriate techniques, resources, and modern engineering



		tool	engineering tools, including prediction and modelling, to <i>complex</i> engineering activities, with an understanding of the limitations.	including prediction and modelling, to <i>broadly-defined</i> engineering activities, with an understanding of the limitations.	tools to <i>well-defined</i> engineering activities, with an awareness of the limitations.
7.	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.
8.	Communication	Level of communication according to type of activities performed	Communicate effectively on <i>complex</i> 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 <i>broadly-defined</i> engineering activities with the engineering community and with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions	Communicate effectively on <i>well-defined</i> 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
9.	The Engineer and Society	Level of knowledge and responsibility	Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to 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.
10.	Ethics	No differentiation in this characteristic	Understand 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.
11.	Environment and Sustainability	No differentiation in this characteristic	Understand the impact of engineering solutions in a societal context and demonstrate knowledge of and need for sustainable development.	Understand the impact of engineering solutions in a societal context and demonstrate knowledge of and need for sustainable development.	Understand the impact of engineering solutions in a societal context and demonstrate knowledge of and need for sustainable development.
12.	Project Management and Finance	Level of management required for differing types of activity	Demonstrate a knowledge and understanding of management and business practices, such as risk and change management, and understand their limitations.	Demonstrate an awareness and understanding of management and business practices, such as risk and change management, and understand their limitations.	Demonstrate an awareness of management and business practices, such as risk and change management.
13.	Life long learning	No differentiation in this characteristic	Recognize the need for, and have the ability to engage in independent and life-long learning.	Recognize the need for, and have the ability to engage in independent and life-long learning.	Recognize the need for, and have the ability to engage in independent and life-long learning.

## 8 International register Competency profiles

To meet the minimum standard of competence a person must demonstrate that he/she is able to practice competently in his/her practice area to the standard expected of a reasonable Professional Engineer/Engineering Technologist/Engineering Technician.

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

		Differentiating Characteristic	Professional Engineer	Engineering Technologist	Engineering Technician
1	Comprehend and apply universal knowledge	Breadth and depth of education and type of knowledge	Comprehend and apply advanced knowledge of the widely-applied principles underpinning good practice	Comprehend and apply the knowledge embodied in widely accepted and applied procedures, processes, systems or methodologies	Comprehend and apply knowledge embodied in standardised practices
2	Comprehend and apply local knowledge	Type of local knowledge	Comprehend and apply advanced knowledge of the widely-applied principles underpinning good practice specific to the jurisdiction in which he/she practices.	Comprehend and apply the knowledge embodied procedures, processes, systems or methodologies that is specific to the jurisdiction in which he/she practices.	Comprehend and apply knowledge embodied in standardised practices specific to the jurisdiction in which he/she practices.
3	Problem analysis	Complexity of analysis	Define, investigate and analyse complex problems	Identify, clarify, and analyse broadly defined problems	Identify, state and analyse well-defined problems
4	Design and development of solutions	Nature of the problem and uniqueness of the solution	Design or develop solutions to complex problems	Design or develop solutions to broadly defined problems	Design or develop solutions to well-defined problems
5	Evaluation	Type of activity	Evaluate the outcomes and impacts of complex activities	Evaluate the outcomes and impacts of broadly defined activities	Evaluate the outcomes and impacts of well-defined activities
6	Responsibility for decisions	Type of activity for which responsibility is taken	Be responsible for making decisions on part or all of complex activities	Be responsible for making decisions on part or all of one or more broadly defined activities	Be responsible for making decisions on part or all of all of one or more well-defined activities

7	<b>Manage engineering activities</b>	Types of activity	Manage part or all of one or more complex activities	Manage part or all of one or more broadly defined activities	Manage part or all of one or more well-defined activities
8	<b>Ethics</b>	No differentiation in this characteristic	Conduct his or her activities ethically	Conduct his or her activities ethically	Conduct his or her activities ethically
9	<b>Protection of society</b>	Types of activity	Recognise the reasonably foreseeable social, cultural and environmental effects of complex activities generally, and have regard to the need for sustainability	Recognise the reasonably foreseeable social, cultural and environmental effects of broadly-defined activities generally, and have regard to the need for sustainability	Recognise the reasonably foreseeable social, cultural and environmental effects of well-defined activities generally, and have regard to the need for sustainability
10	<b>Communication</b>	No differentiation in this characteristic	Communicate clearly with others in the course of his or her activities	Communicate clearly with others in the course of his or her activities	Communicate clearly with others in the course of his or her activities
11	<b>Lifelong learning</b>	No differentiation in this characteristic	Undertake CPD activities sufficient to maintain and extend his or her competence	Undertake CPD activities sufficient to maintain and extend his or her competence	Undertake CPD activities sufficient to maintain and extend his or her competence
12	<b>Judgement</b>	Level of judgement in relation to type of activity	Exercise sound judgement in the course of his or her complex activities	Exercise sound judgement in the course of his or her broadly-defined activities	Exercise sound judgement in the course of his or her well-defined activities
13	<b>Legal and regulatory</b>	No differentiation in this characteristic	Meet all legal and regulatory requirements and protect public health and safety in the course of his or her activities	Meet all legal and regulatory requirements and protect public health and safety in the course of his or her activities	Meet all legal and regulatory requirements and protect public health and safety in the course of his or her activities

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## **5. Managing Changes in Standards Under the Education Accords**

**Discussion Paper for the  
Education Forum of IEM 2005  
Submitted by EC<sup>UK</sup>**

**Managing Changes in Standards  
under the Education Accords**

All the education accords (Washington, Sydney and Dublin) are based on the recognition of substantial equivalence and this equivalence, ie the de facto setting of an accord norm, was established at the time of setting up each of the accords. The accords are thus based on the national conditions which existed initially, in the case of the Washington Accord to the position of 16 years ago.

Education is not static, and neither are other factors which impinge on registration/licensing requirements. As signatories are well aware, the world – and employers' needs – are moving on, with major changes arising through globalisation and other competitive pressures. Thus multilateral agreements which are going to be long standing need to incorporate procedures that will ensure that issues which arise from evolutionary changes in the education and registration of professional engineers can be addressed. None of the accords have established principles or guidelines for managing such change and this paper is intended to open a debate which will lead to the establishment of suitable principles and procedures.

It is particularly timely that this matter be considered as the Washington Accord (as the longest running) is being affected by issues which arise from changes in national requirements and such effects are increasingly likely. In the USA, NCEES is debating the raising of licensure requirements to "ABET accredited bachelor degree plus 30 credits", in Europe the Bologna Declaration is affecting the length of university programmes and in response to Bologna and other perceived national needs, the UK has already made changes to its education requirements, eg for Chartered Engineer from BEng (Hons) to BEng (Hons) plus Masters programmes (or an integrated Masters).

The issues which arise when a signatory makes a change, invariably a raising, of its education requirement are summarised below.

The signatory which has raised its standard is faced with overseas applicants for registration who have degrees which were, under the relevant accord, "substantially equivalent" to its previous requirement. It is thus faced with accepting degrees that are no longer "substantially equivalent" to its new requirements. The options available to that signatory are:

- to persuade all the other signatories to raise the level of the degrees which they accredit,
- to not accept existing Accord degrees (which logically would lead to the signatory either resigning - or being ejected - from the accord),
- to require graduates with existing Accord degrees to pursue further learning to the new standard (with the same consequences as above),
- to continue to accept the existing Accord degrees because the benefits of accord membership outweigh the problems.

The other signatories are faced with a change in the level of accredited degrees which they have committed to accept for registration under the Accord. The issues which arise here depend on how the signatory that has made the change has implemented its increase in educational standard and the effect on its accreditation system.

Where there has been a total change, for example up to year xxxx an accredited bachelor degree met registration requirements and after year xxxx only an accredited long cycle (integrated) master degree did so, then the position appears straightforward. The national list of accredited degrees will contain integrated master degrees accredited post xxxx, which are greater than the Accord norm and which meet the national registration requirement, and will continue to contain the pre xxxx accredited bachelor degrees, which are at the Accord norm and also meet the grandfathered national registration requirement. Thus the list should be accepted in its entirety.

On the other hand, the signatory that has raised its requirement may choose to continue to accredit bachelor programmes as partly meeting its registration requirements because it recognises for registration purposes accreditation packages of "bachelor plus post graduation master degrees". These accreditation packages exceed the substantial equivalence provisions and meet the national registration requirements so clearly should be accepted under the Accord. However, the bachelor degrees which continue to be accredited post xxxx, although not fully meeting the national registration requirement, are at the same level as (or could be identical to) degrees previously accepted by the Accord. Based on this logic these bachelor degrees continue to meet the academic criteria of the Accord and should be accepted by other signatories as meeting their unchanged registration requirements.

These issues need to be debated so that an acceptable consensus will emerge on how the educational accords can manage changing standards.

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**6. Assisting Developing Countries  
Aspiring to Signatory Status: A  
Developmental Approach**

Washington Accord Meeting of Signatories  
Hong Kong, June 2005

Discussion Paper Submitted by the Engineering Council of South Africa

Assisting Developing Countries Aspiring to Signatory Status:  
A Developmental Approach

This paper is intended to open discussion in the Washington Accord on the situation in which African and other developing countries find themselves in trying to fulfil their desire to ultimately become Signatories. The WA initially had only Signatories. Provisional status was subsequently introduced as a mechanism for working toward Signatory status. An intending Signatory is normally an already-established accrediting body with good prospects of attaining Signatory status after two or at most four years in Provisional status. During this time the intending Signatory would be mentored and develop to a point of demonstrating the application of criteria and procedures that are substantially equivalent to those of established Signatories. This mechanism for Provisional status has proven useful for countries with developed or strongly developing accreditation systems.

The WA should anticipate that a number of African countries will wish to attain Signatory status in coming years. Depending on the state of development of the country, several conditions may apply. There may be no body to take on the accreditation function or a long developmental process is needed to establish such a body. The number of universities with engineering programmes in certain African countries may be only one or two in number and it may not be feasible to establish an accrediting body. Provisional status may be unattainable or be too short, leading to failed applications for Signatory status. If Signatory status is achieved, several countries would experience severe “small country effects” and would not be able to afford the verification process and participation in meetings of Signatories.

The programmes may nevertheless be of a quality that is substantially equivalent to WA-recognised programmes or could develop to this level. How then do such programmes achieve mutual recognition?



The point of departure in any discussion of possible changes to routes to Signatory status is that the principle of substantial equivalence of programmes must not be compromised. The thrust of the discussion must centre on arrangements that allow a developmental process and deal with a lack of capacity in the jurisdiction to operate an accreditation system.

This paper does not present a proposal but rather explores options for addressing the problem. These options take into account the established position of ECSA as a Signatory and embryonic regional initiatives in Africa. Possible actions in Africa are, for example:

1. In the best-case scenario ECSA, with the assistance of other Signatories as appropriate, assists a fellow African country to establish an accreditation system and mentors the country through Provisional status.
2. ECSA, with the assistance of universities with accredited programmes as appropriate, assists a university in an African country that seeks WA recognition to improve its programmes to the level of substantial equivalence. ECSA's input would focus on an understanding of criteria acceptable to the WA and the quality assurance process.
3. Where it is not feasible to establish an accreditation system and the universities are willing to have their programmes evaluated using ECSA or other agreed criteria and procedures, the Accord is modified to accept a *strictly limited* form of extra-territorial accreditation in designated countries, specifically approved by a meeting of Signatories.
4. If the development process is expected to be protracted, mechanism 3 may be useful initially, with the local accreditation system being phased in over time.
5. Form a regional accrediting alliance and that alliance seeks Washington Accord Signatory Status.
6. A pre-Provisional status form of recognition may be usefully included in the Accord, say "Developmental status".

No proposals for changes to the Accord or the Rules and Procedures are put forward at this stage, nor are specific countries identified. The request is rather that the Signatories recognise that a developmental approach will be required in certain cases and examine possible approaches. While this paper focusses on Africa, the problems and solutions may apply in other developing countries.

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## **7. Granting Provisional Admission and Signatory Status**

# WASHINGTON ACCORD

Submission to the International Engineering Meetings Workshops  
Hong Kong 13-17 June, 2005

## PROGRESS REPORT

*The following paper is for the consideration of the 2005 meeting of signatories in Hong Kong. It represents a consolidation of earlier development work and emerged in this form following detailed discussion at the 2004 London Workshop.*

## GRANTING PROVISIONAL ADMISSION AND SIGNATORY STATUS

### 1. Executive Summary

- 1.1 This paper suggests that a more structured process is needed to assist new countries wishing to become signatories to the Accord, incorporating developmental support where this may be necessary. The paper proposes such a process, and suggests some additional flexibility in the timing of admission decisions.
- 1.2 This paper is based on the draft discussion document *Development Pathways For Provisional Admission* presented to the June 2003 meeting of signatories in Rotorua, New Zealand and revised and renamed at the June 2004 London Workshop. It incorporates suggestions from the 2003 Meeting of Signatories and the 2004 Workshop.
- 1.3 The objective now is to seek further comment and refinement of the document for approval by signatories. The paper should be read in conjunction with the CCPE paper “Application for Provisional Status in the Washington Accord” adopted in 2001, hereafter referred to as the “Guidelines for Admission”.

### 2. Definition of Terms

#### 2.1 Provisional Signatory status

A Provisional Signatory will have demonstrated that the accreditation system for which it has responsibility appears to be conceptually similar to those of other signatories of the Accord. By conferring Provisional status, the signatories have indicated that they consider that the provisional signatory has the potential capability to reach Full Signatory status. Award of Provisional status in no way implies any guarantee of the granting of Full Signatory status. Equivalence of the engineering education programs concerned shall normally become effective from the date on which the new signatory was admitted to Full Signatory status.

#### 2.2 The Committee

The Chair and Secretary of the Accord acting as a managing committee to steer the processes of application from a country wishing to become a signatory to the Accord.

### **2.3 Mentor**

Signatories assigned by the Committee to act on behalf of the Accord and work with an applicant country through a program of visits and advice in order to assist the applicant country with its progress to Provisional Signatory status and/or to Full Signatory status subsequently. A Mentor can act as a Nominator but not as a Reviewer.

Details of the mentoring process are available in the document *Guidelines for Mentors*.

### **2.4 Nominator**

A signatory with detailed knowledge of an applicant country's accreditation system and reports its appraisal to the signatories as part of the admission process of the applicant as a Provisional Signatory.

### **2.5 Reviewer**

A signatory appointed by the committee that visits and reports to the signatories, as part of the process of transition to full signatory status, on the substantial equivalency of a Provisional Signatory program outcomes to Washington Accord members program outcomes

## **3. Introduction**

- 3.1 Increasing numbers of countries are showing interest in joining the Washington Accord. Some may have well-developed accreditation systems that already align closely with those of existing signatories. Others will have systems that are at an early stage of development, or are radically different in character. In these latter cases, it may take considerable time and developmental effort to achieve equivalence, in nature and standard, sufficient for admission to signatory status.
- 3.2 The Accord is at a crossroads in its approach to admitting new members. On the one hand, it must uphold the standards it represents, which form the incentive for others to join. On the other hand, it must not behave like an exclusive club. Gaining admission must not be so difficult that applicant countries become discouraged and turn away.
- 3.3 The Accord does not claim to be superior to other systems. It is simply a voluntary agreement of equivalence among similar systems, using tried and tested approaches to accreditation and mutual verification, and sharing a common view of evolutionary directions. The signatories welcome to membership other countries that wish to adopt similar approaches and share the existing experience.
- 3.4 For countries wishing to join the Accord, there should be a helpful and constructive procedure to help them achieve Full Signatory status, extending over several years if necessary. The existing process has served well during the Accord's formative years. It now needs to be further developed and documented so that the expectations on all parties are clear.

## **4. The present process**

- 4.1 Under the present process for new applications, the applicant country has to find two existing signatories to act as nominators or supporters. It is not clear whether the

nominators are acting on behalf of the applicant or of the Accord. Nor is it clear whether the nominators are certifying that the new country's accreditation system and program outcomes are substantially equivalent to those represented by the Accord. There is a need for these responsibilities to be better defined.

- 4.2 At present, all admission decisions are taken at general meetings of the signatories. If an applicant country is judged not to be ready in all respects for admission, it must wait another two years: it is probably not practicable to hold meetings any more frequently. This places considerable pressure on the decision-making process and on the applicant country. It would be helpful if a way could be found to relieve this pressure while still maintaining the integrity of the process.
- 4.3 The following sections suggest a more structured process for admission, incorporating developmental assistance where needed. They are intended to be suitable for inclusion in expanded *Guidelines for Admission*, if so decided.

## 5. Assessing Equivalence

- 5.1 Assessing equivalence of outcomes is a complex matter. The experience of the existing signatories is that an assessment based on documentation is only a first step – necessary but not sufficient. Confidence in outcomes can only be achieved through a substantial program of visits and in-depth interaction.
- 5.2 In particular, it is difficult to define on paper the standard to which graduates must be able to exercise the required attributes. The same words can embrace a wide range of standards. Documentation can describe criteria and procedures; but standards can only be reliably judged by experienced people through live interaction.
- 5.3 The expected characteristics of an accreditation system and criteria for accreditation, including the attributes expected of engineering graduates, are set out in the present *Guidelines for Admission*. If an applicant country's system appears on paper to be substantially equivalent to those of the Washington Accord, tests of the system in operation might then be:
  - a) Does the operating documentation focus attention on the fundamental criteria for accreditation – in particular, the required graduate attributes – in a way that is clearly evident to the educational institution concerned? Do the criteria translate into procedures that evaluate in depth the outcomes of each program and how they are assured?
  - b) Are accreditation visits conducted according to the documentation, and are the people involved clear about the key features of the criteria and procedures? Are the procedures capable of addressing unusual circumstances in a perceptive way, and is this illustrated in practice? Is there evidence that the criteria and procedures are applied consistently across a diversity of institutions and programs?
  - c) Do the visit reports provide sufficient detail for the Accreditation Board (or equivalent) to make informed decisions whether or not to accredit particular programs, or to impose conditions? Are recommendations and decisions made in accordance with the criteria?

Does the Board demonstrate a capacity to make difficult decisions in a way likely to be beneficial to the engineering profession in the longer term?

- d) Is the outcome standard, as evaluated by existing signatories during live observation and interaction, consistent with that represented by the Washington Accord?
- 5.4 These questions might be seen as a reflection, at system level, of the criteria for accrediting educational programs themselves. They are questions that every signatory faces constantly within its own system.
- 5.5 Substantial equivalence of characteristics, criteria and outcome standard, as set out in the Guidelines and above, are hereafter referred to as “the Requirements” for admission to membership of the Accord.
- 5.6 Applicant countries should understand that the procedures for achieving membership are lengthy not because the signatories are critical of new countries, but because the issues are difficult and comparisons are complex. Building confidence takes time. Even the periodic review of an existing signatory takes eighteen months or more.

## **6. Admission procedure**

- 6.1 The Chair and the Secretariat of the Accord act as a managing committee (hereafter “the Committee”) for new admissions.
- 6.2 A country wishing to become a signatory should first contact the Secretariat.
- 6.3 The Secretariat will provide the *Agreement*, *The Rules and Procedures* as well as *The Guidelines for Admission* (augmented as may be decided at this meeting) and will invite the applicant country to provide preliminary documentation on its accreditation system. The applicant country will be informed that a mentoring service is available should they want to make use of it. Details of the mentoring process are available in the document *Guidelines for Mentors*.
- 6.4 If the documentation does not appear to meet the Requirements in principle, the Committee will advise the applicant country that its system differs from the Requirements in certain fundamental respects (to be indicated) and ask whether the country wishes undertake major development work and pursue its application further when it believes the issues identified have been addressed and the Requirements met.
- 6.5 If the documentation appears to the Committee to meet the Requirements in principle and if it is the wish of the applicant country, the Committee may assign a team of two or three Signatories to act as Mentors to assist the applicant country in progressing to provisional membership. Selection of mentors should recognise any existing relationships with the applicant country and should include (if possible) one signatory familiar with the applicant system, and at least one signatory not familiar with it.

- 6.6 The responsibilities of the mentors are detailed in *Guidelines for Mentoring*. The mentors are appointed by the accord to advise the applicant country in the interest of both parties.
- 6.7 When the applicant country chooses to proceed with its Provisional member application, having worked or not with mentors, it will request two of the existing signatories to act as Nominators. When the Nominators believe the applicant country's accreditation system meets the Requirements, they should recommend to the Signatories that the country be admitted to Provisional membership of the Accord. A detailed statement describing the basis on which the sponsor is able to attest that the applicant system meets the Requirements must support such a recommendation.
- 6.8 Again, if it is the wish of the applicant country, the Committee may assign a team of two or three Signatories to act as Mentors to assist the applicant country in the transition to Full Signatory status.
- 6.9 At the request of the Provisional Member, the Committee will assign three signatories as Reviewers to examine and report on the applicant system and recommend to the Signatories, when they are satisfied that the Requirements for full Signatory status are met. During the period of Provisional status, it shall be open to all Signatories to visit the applicant.
- 6.10 Transition from Provisional to Full Signatory status requires that, as well as meeting the Requirements as defined above, the accreditation system shall be well established (at least one program having gone through a full accreditation cycle) and a substantial proportion of engineering programs offered in the country shall have been evaluated under the system as described. The recommending signatories must have observed visits to a representative cross-section of institutions, and must have observed a range of accreditation decisions.

## **7. Authority for decisions**

- 7.1 A decision to admit as Provisional Signatory shall require the affirmative vote of two-thirds of existing signatories, and a decision to admit to full Signatory status shall require the unanimous vote of existing signatories. Such votes shall normally be taken at general meetings of signatories.
- 7.2 In circumstances where an applicant country is judged to be close to meeting the Requirements for admission to Provisional status, and there are good prospects that the Requirements will be met in the near future, a general meeting of signatories may empower the Committee to admit the country to Provisional status on receipt of one or more further reports confirming that the Nominators believe the Requirements have then been met.
- 7.3 In circumstances where a Provisional member is judged to be close to meeting all requirements for transition to full Signatory status, and there are good prospects that these will be met in the near future, a general meeting of signatories may empower the Committee by unanimous vote to admit the country to full Signatory status on receipt of one or more further reports confirming that all designated reviewers and signatories

believe the requirements have then been met. Prior to admitting a country to full Signatory status on this basis, the Committee shall circulate to all signatories and ensure that there is no objection to admission.

7.4 At least one general meeting of signatories must occur between the admission of a country to Provisional status, and its transition to full Signatory status.

**8. Costs of providing assistance**

In principle, an applicant country is expected to meet the costs incurred by existing signatories in acting as Mentors, Nominators and Reviewers.

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## **8. International Accord Mentoring Guidelines**

## IPENZ ENGINEERS NEW ZEALAND

### Submission to International Engineering Meetings 13-17 June 2005

#### International Accord Mentoring Guidelines

#### Background

The attached Draft International Accord Mentoring Guidelines Version 4 incorporate the changes made at the IEM Workshops in 2004 in London and most of the suggestions made subsequently by Accord signatories as well as minor changes to improve comprehension of the text.

#### Changes not Incorporated

Some of the changes suggested after the 2004 Workshops were not incorporated directly as they appeared to change some fundamentals underpinning the guidelines and may therefore require discussion at IEM 2005 in Hong Kong.

Particular changes in this category are those suggested by Ireland which are given below extracted from their comments on "Granting provisional admission and signatory status":

- *No mentoring should be provided for those seeking Provisional Status.*
- *Mentors, drawn from existing signatories, should be assigned to an applicant as soon as that applicant has been approved for Provisional Membership. Mentors would be expected to devote a reasonable (not excessive) amount of time to assisting the Provisional Member by explaining WA "policy" on accreditation to enable the applicant to provide the required information about its current accreditation process in the format required; so as to enable the signatories to properly evaluate the application for full signatory status.*

#### Comment

De facto mentoring has been provided to several countries prior to their applying for provisional status. The guidelines specifically envisage mentoring at an early stage prior to application for provisional signatory status. (Section 2.)

The draft guidelines state that the scope of the inputs by the mentors are to be negotiated between the mentors and mentee at an early stage (Section 3.3) which offers sufficient safeguard as to the extent of input required by mentors while allowing for some flexibility to take into account the varying stage of development of mentees.

#### Recommendation

**It is recommended that Accord signatories ratify the Draft International Accord Mentoring Guidelines (Version 4) attached.**

# Draft International Accord Mentoring Guidelines

## For Ratification at the International Engineering Meetings 13-17 June 2005

### 1. Background

An increasing number of jurisdictions are expressing interest in being part of one or more international agreements that have as their main purpose the international benchmarking of engineering education or engineering practice standards.

International Accord signatories, when requested by the Secretariat, are willing to provide support, advice and guidance through a mentoring system to jurisdictions that are anticipating making formal application for provisional or full signatory status to an International Accord.

### 2. Definitions

International Accord	Inclusive term referring to the Washington Accord, Sydney Accord or Dublin Accord, Engineers Mobility Forum, APEC Engineer Agreement or any other accord agreement which agrees to adopt these guidelines.
Signatory	Inclusive term referring to signatories or members of an International Accord
Mentoring	International Accord mentoring is a process by which an appointed mentoring team provides support and guidance to an engineering professional/ licensing or qualification approval body that has jurisdictional approval to apply for provisional or full signatory status to one or more of the International Accords. The mentoring role will focus on providing advice and guidance on the accreditation or competence assessment policies and procedures and education or professional standards of the mentee so that the mentee is given every opportunity, on application, to become a provisional or full signatory to the relevant International Accord.
Mentor	Within these guidelines the term 'mentor' will refer to a mentoring team appointed by the Secretariat of the relevant International Accord. The mentoring team will consist of two or three representatives from full signatories of the International Accord to which the mentee is committed to applying for provisional or full signatory status.



The report must be able to be discussed by the mentors with the accreditation approval board and/or competence register approval body within their home organisations for quality assurance and to ensure consistency of approach.

The report may only be released by the mentor, or their International Accord signatories, to third parties, including the Secretariat, by permission of the mentee.

A professional/accreditation body seeking to become a provisional or full signatory to an International Accord may include any mentoring reports in the written information they provide to demonstrate that their accreditation or competence assessment systems and standards are substantially equivalent to those of other signatories.

## 5.2 Mentor Report to International Accord Secretariat

Mentors will provide an annual report to the International Accord Secretariat that includes:

- the agreed terms of reference of the mentoring relationship;
- the facts of mentor visits to the jurisdiction of the mentee e.g. dates of visits, activities undertaken during the visit;
- a general statement as to progress toward provisional or full signatory status.

## 6 Costs

Any direct costs associated with International Accord mentoring are met by the mentee and will be on the same basis as costs of signatory reviews.

## 7 International Accord Nominators

The International Accord signatories that have had a representative on a mentoring team are likely, but are not required, to be nominators for an application for provisional signatory status by the mentee.

## 8 International Accord Reviewers

An International Accord Review Team, set up to review a provisional signatory for full signatory status, will consist of signatory representatives that have **not** had representation on the mentoring team.

## 9 Consultants

Professional/accreditation bodies sometimes contract the services of a consultant to provide them with support in the development of accreditation/competence assessment systems and qualification/professional standards. These consultants are paid a fee for their services and are not appointed by Secretariats of International Accords.

If a professional/accreditation body chooses to contract the services of a consultant they must do so at their own risk. If a signatory is providing consultancy support to a professional/accreditation body they must inform

other signatories of the relevant International Accord so as to declare any pecuniary interest.

**10 Mentoring provided by Individual Signatories**

Professional/accreditation bodies often approach signatories directly to request support through a mentoring arrangement. If signatories accept this request then they must inform the Secretariat of the relevant International Accord so that other signatories are made aware of the private mentoring arrangement. The International Accord, as a whole, cannot be responsible for the quality of advice and support provided through this private mentoring arrangement which has not been co-ordinated through the Secretariat of the relevant International Accord.

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**9. Guidelines and Schedule of Rule  
Changes for Systematic Monetary and  
Verification of Signatories including  
Small Countries**

## **IPENZ ENGINEERS NEW ZEALAND**

### **Submission to International Engineering Meetings 13-17 June 2004**

#### **Guidelines and Schedule of Rule Changes for Systematic Monitoring and Verification of Signatories including Small Nations**

##### **1. Background**

At the 2003 International Engineering Meetings (IEM) in Rotorua suggested guidelines for review were tabled. These are attached as Appendix 1 for information. These changes resulted from the experience of the review of Australian accreditations in 2002. Due to an administrative oversight these were not voted on at that meeting but have been used in subsequent reviews and are incorporated in Appendix 4.

In 2003 and 2004 the accreditation practices in Japan, a provisional member of the Washington Accord(WA), were reviewed by a multinational WA team. This was the first major review in a non English speaking country and further possible changes to the rules and procedures have been included in the draft report completed in early 2005. Excerpts from that report dealing with the suggested possible changes are attached as Appendix 2 and consequential suggested guidelines and changes to the rules and procedures were further developed at IEM meetings in June 2004.

Also at the 2003 meeting at Rotorua it was recognised that the standard review procedures would be likely to be ineffective and or prohibitively expensive for small nations where it would not prove possible to see accreditation visits at more than one university during any one visit. IPENZ was given permission to trial different procedures for use by small nations. The procedures proposed and rationale are given in Appendix 3 and the consequential suggested changes to the rules and procedures were also further developed at the IEM 2004.

##### **2. The Purpose of this Paper**

This proposal draws together in one schedule the various proposed amendments and makes suggestions for additional modifications. The suggested amendments incorporating the developments from IEM2004 and further subsequent submissions are contained in Appendix 4.

Note that some sections are guidelines as it is felt that to elevate some useful suggestions to the status of firm rules and procedures implies an unintended rigidity of process with insufficient room for adjustment for individual circumstances.

##### **3. Recommendation**

**That the workshop ratify the procedures and rule changes given in Appendix 4**



## **Appendix 1:**

### **Suggested changes tabled in June 2003 at Rotorua**

#### **Sixth Biennial Meeting of the Washington Accord Signatories June 2003 New Zealand**

#### **Guidelines and Schedule for Systematic Monitoring and Verification of Signatories**

**In accordance with the Rules and Procedures for Periodic Review agreed upon by the Washington Accord Signatories at its 28 October 1997 meeting, the following guidelines for monitoring visits are presented for consideration:**

**The amendments from the original are in bold** (note that these are the changes from the document which was originally discussed at the June 2003 meeting)

1. Each signatory shall be visited every six years unless the occurrence of system changes impact accreditation criteria, process and procedures. In such cases, signatories shall be expected to report such changes to the Secretariat and other signatories and be available to host a comprehensive review visit **earlier** if warranted. (Item 1.1, Rules and Procedures)
2. The monitoring visit schedule shall be prepared by the Secretariat and approved by all signatories at each biennial meeting for the upcoming cycle.
3. As stated under item 1.5 of Rules and Procedures, each signatory shall receive a visit notice from the Secretariat no less than six months prior to the intended date of the visit.
4. To meet monitoring visit obligations, each signatory shall submit to the Secretariat annually a list of nominees (two per country) for the visiting team. Visiting teams shall embody a range of expertise and shall include at least one academic and one industrial representative. According to the Washington Accord Rules and Procedures, the Secretariat shall select at least three visitors for the visiting review team and at least two will physically take part in the visit. (Items 1.2 and 1.3, Rules and Procedures)
5. In selecting visitors, signatories as well as the Secretariat shall be cognizant of any activities that may impede individuals from participating due to conflict of interest. (Items 1.3 and 1.4, Rules and Procedures)
6. **The chair of the review team shall be appointed by the Secretariat at the time of notification of the team composition.**
7. *This clause to be rewritten following discussion on small nations paper on 10Jun03.* Confirmation of substantial equivalency shall be based on visits of at least two institutions and disciplines undergoing evaluation. In addition, at least one team member shall attend a meeting of the accreditation board or other body responsible for final accreditation actions.
8. **Design of a typical visit:**  
**In order to make most efficient use of time and to ensure timely production of the report the following procedures should be adopted:**

- a. A copy of a previous review report will be made available to the review team.
- b. The review team should meet one day prior to the first visit to review data, determine aspects to be examined in more detail, outline the report structure, allocate individual team member responsibilities and meet with the host signatory to obtain background information and clarify the accreditation systems and the visit programme.
- c. The visit or visits accompanying the accreditation panels shall take place in accordance with the protocols in 9 below.
- d. A post-visit team meeting to structure the report and if possible prepare it in outline

9. In general the protocols to be observed by the review team during the visit should be:

- a. The team should be non-participatory observers.
- b. The team should refrain from making comments on the procedures or outcomes during the visits and only comment to the accreditation panel when requested to do so, after visits have been concluded and the intended recommendations made known to the universities concerned.
- c. When necessary and in order to achieve complete coverage the team should split to accompany accreditation sub-panels according to the individual specialization of the team members.
- d. The team may participate in the discussions with students as their questions in these forums may assist the team to understand the educational culture and student perceptions. This is judged to not unduly influence the accreditation process.
- e. A draft team report must be submitted to the accreditation agency being reviewed to ensure correctness as to matters of fact.

10. At the conclusion of a visit to a given signatory, the Review Team shall prepare a report with recommendations for the Secretariat that, in turn, shall be distributed to the other signatories. The report shall be submitted no less than 120 days prior to the next biennial meeting of the Washington Accord signatories.

11. The Final Report shall include:

- a. An executive summary outlining major system characteristics and citing recommended action with the appropriate action statement. (Items 1.7 a-c, **Rules and Procedures**)
- b. An overall introduction to accreditation system under review and its standards
- c. Information on accreditation policies/procedures and criteria for the system under review, including a comprehensive analysis of how the accreditation process addresses marginal, difficult conditional actions
- d. A brief description of the educational institution and a listing of the programmes and results in order set the context for the review
- e. Information on the conformity of the system with its own published accreditation policies and procedures
- f. Indications of any stated or observed substantial change to the accreditation criteria, policies or procedures of the system under review and the rationale for the change
- g. Any statement of weakness or deficiency.

A weakness indicates that the accreditation system is satisfactory but lacks the **robustness** that assures that the quality of the system not be compromised prior to the next general review.

A deficiency indicates that the processes, policies and procedures for granting accreditation to engineering programs have been examined and found not to be **equivalent to** comparable practices of other signatories that assess the quality of engineering programs. This action results in the reversal of full signatory's status to that of conditional.

**h. Recommended action to the Washington Accord signatories in accordance with Clause 1.7 of the Rules and Procedures**

12. The Interim Review (IR) shall focus on the remedial actions taken by the signatory to address the deficiencies or weaknesses cited by the review team and shall be submitted to the Secretariat. The review team that visited the signatory country shall review the interim review report, and the resulting recommended action shall be submitted in writing to the Secretariat. A copy of such report shall be furnished to each signatory through the Secretariat for discussion and approval by all signatories.

13. REVOCATION OF SIGNATORY STATUS:

- a. The revocation of signatory status shall not affect the recognition of graduates who have completed academic degrees the academic year preceding the termination date. (Item 1.8, Rules and Procedures)
- b. Upon revocation of full status, the subject signatory's "Lists of Accredited Programs" shall be annotated to indicate revocation.
- c. In the event the subject signatory does not appeal the revocation decision, immediate assistance may be provided upon request by the subject signatory.
- d. Any signatory whose status has been reverted to **provisional** shall have two years to provide evidence of substantive improvements and corrective actions. Failure to do so will result in revocation of **provisional** status with right to appeal.

14. APPEAL PROCESS:

- a. Appeals, requests for reconsiderations, and requests for revisits shall be submitted, in writing, to the Secretariat within 60 days of receiving the revocation notice.
- b. Requests for reconsideration may be based on the grounds that the final action was inappropriate because of errors of facts or incomplete information.
- c. As indicated under item 1.9 of Rules and Procedures, "the subject signatory may request an independent review within six months by an appeal panel which is established in the same manner, but has no membership in common with the original review team."
- d. The appeal panel shall determine the procedures and criteria under which it operates. (Item 1.9, Rules and Procedures)
- e. The full cost of any appeal activity, such as a revisit, shall be borne by the subject signatory.
- f. Full signatory **status** will continue until the appeal process has been completed.
- g. The outcome of any appeal shall be binding on all signatories
- h. The right to appeal may be exercised only once.

15. Final Actions, including resolution for termination of a signatory status, and the outcome of an appeal review shall require the **two thirds** vote of the signatories (not including the subject signatory).

16. Clause 1.7a of the Rules and Procedures to be amended as follows: delete “those from the other signatories” and replace with “the systems known to the review team”

**PROPOSED MONITORING VISIT SCHEDULE**

<b>Signatory</b>	<b>Previous Visit</b>	<b>Action*</b>	<b>Follow-Up Visit/Action</b>	<b>Next Action Notification</b>
Australia: <b>IEAust</b>	1996	GR	2002	2001
Canada: <b>CEAB/CCPE</b>	2000	GR	2006	2005
Hong Kong: <b>HKIE</b>	1997	GR	2005	2004
Ireland: <b>IEI</b>	<b>N/A</b>	GR	2004	2003
New Zealand: <b>IPENZ</b>	1997	GR	2005**	2004
South Africa: <b>ECSA</b>	1999	GR	2005	2004
United Kingdom: <b>ENGC</b>	<b>N/A</b>	GR	2004	2003
United States: <b>ABET</b>	2000	GR	2006	2005

\* GR=General Review; IR=Interim Review; AP=Appeal

\*\* Interim Report in lieu of comprehensive visit to level the number of visits per year

(previous revision 11.14.01)

## **Appendix 2**

### ***Excerpts from Report on The Review of Japan Accreditation Board for Engineering Education***

The following extracts are from the report on the WA review of JABEE conducted over November 2003 and April 2004.

#### ***“Interactions With Visiting Teams During Observations***

Given that the WA observers are present to observe the process of accreditation and not to assess the issues being reviewed by the accrediting team(s) being observed, the manner in which the observers interact with the visiting team(s) should be clearly defined by the WA. During this observation the three team members elected to keep a very low profile, as explained earlier, and this was judged to be an effective approach to observation without participation. Few, if any, questions were asked by the observers, and few remarks other than expressions of appreciation for the extended hospitality and cooperation were made by the WA chair.

#### ***Reimbursement Procedures***

The reimbursement by JABEE for the direct expenses by the visitors was exemplary, including wire-transfers to the individual observers to cover airfare, cash repayment of local expenses such as bus fares, and coverage by JABEE of all hotel expenses. Given that each WA observer during this visit was traveling under the auspices of his own country's accreditation organization, however, it was some concern on the part of the observers regarding whether expenses and reimbursements should be handled through those organizations rather than directly with each observer. This issue should be addressed within the WA and a policy established to direct both the observers and the organization being observed.

#### ***Instructions to the Local Team from Their National Accreditation Agency***

The observers during this visit received little guidance from their own national accrediting agencies. As a result, there was some concern as to whether they should judge the system being observed from a broad point of view (the “WA perspective”) or in relation to the policies and procedures specific to their own national accrediting systems. The question, therefore, is what information should those observers provide to their own national organizations separately from this report, for example. Some WA guidance regarding this issue would seem to be needed.

#### ***Review of Complete National Accreditation Process***

Given that the accreditation process generally includes visits to programs in the fall of one year and a centralized decision-making meeting in the spring of the next year, proper observation of a country's accreditation system requires observation of both such events, necessitating two trips to the candidate country. Issues to be considered in this regard include: (1) should the entire observing team return for the decision-making meeting or only the chair, and (2) the observers and the accrediting agency being visited need to be informed from the beginning of the expenses and time associated with such a dual observation. The

members of the present observation team believe that in this case having the entire team return to Japan to observe JABEE's decision-making meeting has been a key part of formulating the recommendations made in this report, and recommend that this approach be allowed for in future observations despite the added expenses and time commitments required. In the event that the reviewing team considers that a return visit by the whole team is not necessary it can then inform the host country.

### ***Visit to Office of the Accrediting Agency being Observed***

Given that one aspect of an observation is assessment of the efficiency and stability of the national agency administering the engineering accreditation process, each such observation should include a visit to the offices of that organization.

### ***Procedures for Non-English speaking countries***

Assuming that future WA observations will likely include more non-English speaking countries, the following comments are offered for such observations.

### **Translator Numbers and Procedures**

The use of a single translator at each visited program was, in the opinion of the current observers, a very effective approach to providing information about the issues being addressed verbally during the observed sessions. The selection of translators is an important issue, however. The accreditation organization being observed should be responsible for that selection, but should be cautioned to select individuals who, in addition to having good language skills and a knowledge of the accreditation process, agree to hold a neutral position with regard to the observation process.

### **Multiple Program Evaluation**

When multiple programs are to be observed at the same institution, the recommendation of the current observers is that they remain as a group with their translator, but that they time-share their participation among the multiple visiting teams.

### **Documents to be Translated in Advance**

It should be the responsibility of the accrediting organization to be observed to provide English translations of the key parts of the pre-visit documents from each visit that is to be observed. These documents need not be *all* of the non-English documentation, but should include sufficient information for the observers to become familiar with the observed institutions, programs, and visiting teams. Where necessary, some additional translation may be requested during the observation, but that should be minimized. The selection of documents translated by JABEE can be used as an indication of what needs to be done, since the current observation team felt that that selection was appropriate to the purposes of the observation.”

## **Appendix 3**

### **Washington Accord Reviews for Small Nations**

#### **Proposed IPENZ Process**

##### **A3.1 Introduction**

The normal procedures for full members of the Washington Accord (WA) require a formal review visit every six years (for the purposes of discussion this is called Procedure A: Periodic Review). At the June 2003 Washington Accord meeting it was agreed that IPENZ would trial an alternative review system more suitable for signatories who are small nations (Procedure B: Continuous Review).

To support the international benchmarking of engineering programmes in a small national engineering education system IPENZ has always appointed accreditation panels that had some international representation generally academics. IPENZ normally reviews all the engineering programmes at a single educational provider by means of a multi-panel visit team under the direction of an experienced visit leader. Each programme is reviewed by a two person panel comprising an academic and a person from industry. In some cases where programmes have high degree of commonality the team may be enlarged or one team may review both programmes. Thus in any one visit to a university with say four programmes to be accredited there would probably a total of eight visitors plus visit leader (who is always a senior and experienced person from industry) plus IPENZ support (generally the Director of Education and Learning) and include two or three overseas academics

IPENZ suggests strengthening the protocol for the appointment of these international representatives and providing for additional monitoring and reporting duties by them on behalf of the Washington Accord as outlined below:

##### **A3.2 Appointment of International Representatives**

For each of not less than three accreditation visits (preferably to separate educational institutions) within a five year period the country being reviewed will ensure a panel of international representatives forward a report to the Washington Accord Secretariat. The format of the report is outlined below.

International panel members fulfil a dual role, firstly as accreditation panel members and secondly as WA Reviewers. As reviewers they will be expected to submit a combined WA Review Report to the WA Secretariat on the procedures and practices observed.

The WA Reviewers must reside in a jurisdiction that has WA signatory status and must be approved by the WA Signatory of their home jurisdiction.

The number of international accreditation panel members that make up the WA Review Team for any particular visit will consist of between one and three persons depending on the size of the full Accreditation Team.

##### **A3.3 Accreditation Visits**

Not less than three accreditation visits to separate institutions must be conducted over the five year period.

For example the proposed programme for New Zealand over the next five years is as follows:

- 2004 Massey University (two international representatives formed the WA Review Team)
- 2005 University of Auckland (three international representatives will form the WA Review Team)
- 2005 Manukau Institute of Technology (one international representative will form the WA Review Team)
- 2006 University of Canterbury (three international representatives will form the WA Review Team)

The WA reviewers will meet with at least the Chair of the Accreditation Board<sup>1</sup> and advise of their findings

### **A3.4 Confirmation Process**

If any of the WA signatories are concerned that the reports do not demonstrate satisfactory compliance they may notify the Secretariat prior to the end of the review period. The WA Secretariat may then appoint an Overall Review Team (ORT) to prepare an overall report. In this case the Secretariat will identify three international accreditation panel members who have contributed to three different WA Reports on the subject country. The WA Secretariat will seek approval from the appropriate WA signatories for these reviewers to be members of the ORT. The Overall Review Team should have representation from at least two WA signatories.

The ORT will be presented with written documentation from the country being reviewed and be given a copy of all WA Review Reports in the period and may hold discussions with the leaders of any of the Review Teams. It may, with the agreement of the subject country, observe an accreditation visit.

The ORT will visit the national office of the country being reviewed and meet with that country's Accreditation Board.

The Overall Review Team will prepare a report stating whether or not the accreditation system of the subject country meets the requirements of the Washington Accord.

If no objections to the interim reports are received by the secretariat the accreditation procedures and practices of the subject country shall be deemed to comply.

### **A3.5 Costs**

The costs of the reviews shall be born by the subject country.

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<sup>1</sup> In the case of IPENZ this is the Chair of the Standards and Accreditation Board



## **Appendix 4**

### **Guidelines for Monitoring Visits**

**In accordance with the Rules and Procedures for Periodic Review agreed upon by the Washington Accord Signatories at its 28 October 1997 meeting, the following guidelines for monitoring visits are presented for consideration:**

- 1 Each signatory shall be subject to review every six year either by a single review visit (Procedure A: Periodic Review) or by ongoing assessment over the period by other Washington Accord members of accreditation panels (Procedure B: Continuous Review).
- 2 The type of procedure to be used for any individual country shall be determined and approved by all signatories prior to the commencement of the review period.

#### **Procedure A: Periodic Review**

- 3 Each signatory shall be visited every six years unless the occurrence of system changes impact accreditation criteria, process and procedures. In such cases, signatories shall be expected to report such changes to the Secretariat and other signatories and be available to host a comprehensive review visit earlier if warranted. (Item 1.1, Rules and Procedures)
- 4 The monitoring visit schedule shall be prepared by the Secretariat and approved by all signatories at each biennial meeting for the upcoming cycle.
- 5 As stated under item 1.5 of Rules and Procedures, each signatory shall receive a visit notice from the Secretariat no less than six months prior to the intended date of the visit.
- 6 To meet monitoring visit obligations, each signatory shall submit to the Secretariat annually a list of nominees (two per country) for the visiting team. Visiting teams shall embody a range of expertise and shall include at least one academic and one industrial representative. According to the Washington Accord Rules and Procedures, the Secretariat shall select at least three visitors for the visiting review team and normally at least two will physically take part in the visit. (Items 1.2 and 1.3, Rules and Procedures)
- 7 In selecting visitors, signatories as well as the Secretariat shall be cognisant of any activities that may impede individuals from participating due to conflict of interest. (Items 1.3 and 1.4, Rules and Procedures)
- 8 The chair of the review team shall be appointed by the Secretariat at the time of notification of the team composition.
- 9 Confirmation of substantial equivalency shall be based on visits to at least two institutions including a total of at least four programs undergoing evaluation. In addition, at least one team member shall attend a meeting of the accreditation board or other body responsible for final accreditation actions. In the case of Procedure B the procedures given elsewhere shall be followed.

### **Design of a typical visit:**

- 10 In order to make most efficient use of time and to ensure timely production of the report the following procedures should be adopted:
  - a. A copy of a previous review report will be made available to the review team.
  - b. The review team should meet one day prior to the first visit to review data, determine aspects to be examined in more detail, outline the report structure, allocate individual team member responsibilities and meet with the host signatory to obtain background information and clarify the accreditation systems and the visit programme.
  - c. The visit or visits accompanying the accreditation panels shall take place in accordance with the protocols below.
  - d. A post-visit team meeting to structure the report and if possible prepare it in outline
  - e. The review team should visit the office of the national agency administering the engineering accreditation process
  - f. The review team should return to observe the decision making meeting of the accreditation agency unless the team determines that such a visit shall made only by the team chair.
  
- 11 In general the protocols to be observed by the review team during the visit should be:
  - a. The team should be non-participatory observers.
  - b. The team should refrain from making comments on the procedures or outcomes during the visits and only comment to the accreditation panel when requested to do so, after visits have been concluded and the intended recommendations made known to the universities concerned.
  - c. When necessary and in order to achieve complete coverage the team should split to accompany accreditation sub-panels according to the individual specialization of the team members.
  - d. The team may participate in the discussions with students as their questions in these forums may assist the team to understand the educational culture and student perceptions. This is judged to not unduly influence the accreditation process.
  - e. A draft team report must be submitted to the accreditation agency being reviewed to ensure correctness as to matters of fact.

### **Procedures B: Continuous Review**

- 12 For this procedure, review will be continuous for the first five years of a six year period, and then, if required, in the sixth year there may be confirmatory actions as described below.
- 13 International panel members fulfil a dual role, firstly as accreditation panel members and secondly as WA Reviewers. As reviewers they will be expected to submit a combined WA Review Report to the WA Secretariat on the procedures and practices observed.
- 14 For each of not less than three accreditation visits, where possible to separate educational institutions, within a five year period the country being reviewed will ensure a panel of international representatives forward a report to the Washington Accord Secretariat. The format of the report is outlined in Clause 27.
- 15 For this procedure to be used the country under review shall ensure that a proportion of accreditation visit panel members but not less than two per visit shall be from other

Washington Accord countries approved by the WA Secretariat for this purpose. The WA Reviewers must reside in a jurisdiction that has WA signatory status and must be appointed or approved by the WA Signatory of their home jurisdiction.

- 16 The number of international accreditation panel members that make up the WA Review Team for any particular visit will consist of between one and three persons depending on the size of the full Accreditation Team.
- 17 Not less than three accreditation visits to institutions covering in total not less than four programs must be conducted over the five year period.
- 18 At least one of the review teams must, in the last two years of the period, meet with the accreditation agency, review the accreditation procedures with the agency and observe an accreditation board decision meeting .
- 19 At the end of the five year period, and at least fifteen months prior to the end of the six year period the secretariat will circulate all Review Reports from the previous five year period to all signatories.
- 20 If no objections to the acceptability of the Review Reports as sufficiently demonstrating equivalence are received by the secretariat twelve months prior to the end of the review period the accreditation procedures and practices of the subject country shall be deemed to comply and the review is complete. The process will then restart in the next six year review period should Procedure B continue to apply.
- 21 If any of the WA signatories are concerned that the Review Reports do not demonstrate satisfactory compliance they may notify the Secretariat at least nine months prior to the end of the review period. The WA Secretariat shall then appoint an Overall Review Team (ORT) to prepare an overall report. In this case the Secretariat will identify three international accreditation panel members who have contributed to three different WA Reports on the subject country. The WA Secretariat will seek approval from the appropriate WA signatories for these reviewers to be members of the ORT. The Overall Review Team should have representation from at least two WA signatories.
- 22 The ORT will be presented with written documentation from the country being reviewed and be given a copy of all WA Review Reports in the period and may hold discussions with the leaders of any of the Review Teams. It may, with the agreement of the subject country, observe an accreditation visit.
- 23 The ORT will visit the national office of the country being reviewed and meet with that country's Accreditation Board within the last year of the six year period to which the continuous review applies.
- 24 The Overall Review Team will prepare a report stating whether or not the accreditation system of the subject country meets the requirements of the Washington Accord, based on the team members' knowledge of WA signatory systems.

#### **General Protocols applying to both Procedures**

- 25 Protocols to be observed for non English speaking countries where the review team members are not fluent in the language of the country being reviewed:
  - a. English translations shall be provided of the key parts of the pre-visit documents for each visit that is to be observed and must include sufficient information for the

- observers to become familiar with the observed institutions, programs, and visiting teams.
- b. For Procedure A: Periodic Review, a single translator at each visited program shall be provided. The selection of translators is an important issue. The accreditation organization being observed should be responsible for that selection, but should select individuals who, in addition to having good language skills and a knowledge of the accreditation process, agree to hold a neutral position with regard to the observation process
  - c. When multiple programs are to be observed at the same institution, it is recommended that the reviewer team remain as a group with their translator, but that they time-share their participation among the multiple visiting panels.
  - d. For Procedure B: Continuous Review, translators must be provided for each panel on which there is an international reviewer. .
- 26 At the conclusion of a visit to a given signatory, the Review Team shall prepare a report with recommendations for the Secretariat that, in turn, shall be distributed to the other signatories. For Procedure A in all cases, and in Procedure B in cases when an Overall Review team was appointed, the report shall be submitted no less than 90 days prior to the next biennial meeting of the Washington Accord signatories.
- 27 The Final Report shall include:
- a. An executive summary outlining major system characteristics and citing recommended action with the appropriate action statement. (Items 1.7 a-c, Rules and Procedures)
  - b. An overall introduction to accreditation system under review and its standards
  - c. Information on accreditation policies/procedures and criteria for the system under review, including a comprehensive analysis of how the accreditation process addresses marginal, difficult conditional actions
  - d. A brief description of the educational institution and a listing of the programmes and results in order set the context for the review
  - e. Information on the conformity of the system with its own published accreditation policies and procedures
  - f. Indications of any stated or observed substantial change to the accreditation criteria, policies or procedures of the system under review and the rationale for the change
  - g. A statement as to whether the standard of the graduates of accredited programs are substantially equivalent to graduates of other WA signatories.
  - h. Any statement of weakness or deficiency.  
A weakness indicates that the accreditation system is satisfactory but lacks the robustness that assures that the quality of the system not be compromised prior to the next general review.  
A deficiency indicates that the processes, policies and procedures for granting accreditation to engineering programs have been examined and found not to be equivalent to comparable practices of other signatories that assess the quality of engineering programs. This action results in the reversal of full signatory's status to that of conditional.
  - i. Recommended action to the Washington Accord signatories in accordance with Clause 1.7 of the Rules and Procedures
- 28 Review reports may be not be communicated to any signatory except through the Secretariat except that the draft reports may be submitted by the reviewers to their home organisations for the purposes of quality assurance and advice and to the agency being reviewed in accordance with Clause 11e.

- 29 In Procedure B, the Overall Review Report shall additionally focus on the remedial actions taken by the signatory to address the deficiencies or weaknesses cited by the earlier Review teams and shall be submitted to the Secretariat.
- 30 **REVOCAION OF SIGNATORY STATUS:**
- a. The revocation of signatory status shall not affect the recognition of graduates who have completed academic degrees the academic year preceding the termination date. (Item 1.8, Rules and Procedures)
  - b. Upon revocation of full status, the subject signatory's "Lists of Accredited Programs" shall be annotated to indicate revocation.
  - c. In the event the subject signatory does not appeal the revocation decision, immediate assistance may be provided upon request of the subject signatory.
  - d. Any signatory whose status has been reverted to provisional shall have two years to provide evidence of substantive improvements and corrective actions. Failure to do so will result in revocation of provisional status with right to appeal.
- 31 **APPEAL PROCESS:**
- a. Appeals, requests for reconsiderations, and requests for revisits shall be submitted, in writing, to the Secretariat within 60 days of receiving the revocation notice.
  - b. Requests for reconsideration may be based on the grounds that the final action was inappropriate because of errors of facts or incomplete information.
  - c. As indicated under item 1.9 of Rules and Procedures, "the subject signatory may request an independent review within six months by an appeal panel which is established in the same manner, but has no membership in common with the original review team."
  - d. The appeal panel shall determine the procedures and criteria under which it operates. (Item 1.9, Rules and Procedures)
  - e. The full cost of any appeal activity, such as a revisit, shall be borne by the subject signatory.
  - f. Full signatory status will continue until the appeal process has been completed.
  - i. The outcome of any appeal shall be binding on all signatories
  - j. The right to appeal may be exercised only once.
- 32 Final Actions, including resolution for termination of a signatory status, and the outcome of an appeal review shall require the two thirds vote of the signatories (not including the subject signatory).
- 33 Clause 1.7a of the to be Rules and Procedures to be amended as follows: delete "those from the other signatories" and replace with "the systems known to the review team"

#### **Costs**

- 34 The costs of the reviews shall be born by the subject country but for Washington Accord review team members shall be limited to the payment of travel, accommodation and incidental expenses. Such costs shall be reimbursed via the reviewers' organisations or, with the agreement of the reviewers' organisations, directly to the reviewers. Arrangements shall be made by the host acting in agreement with the person travelling. The cost basis shall be:

- Travel shall be economy class except that flights exceeding 8 hours duration or overnight shall be business class
- Accommodation shall be fully serviced 3 Star plus to 4 Star