Report on 2010 AEESEAP Workshop towards Washington Accord

Hajime Fujita¹, Rowena Christina L. Guevara² and Hong Gao³

¹ 1st Vice President, AEESEAP, Professor, Nihon University
   1-8 Kanda Surugadai, Chiyoda-ku, Tokyo 101-8308 Japan
   fujita@mech.cst.nihon-u.ac.jp
² 2nd Vice President, AEESEAP, Professor, University of Philippines, Philippines
³ President, AEESEAP, Professor, Tsinghua University, China

Abstract

AEESEAP is the acronym for the Association for Engineering Education in Southeast and East Asia and the Pacific. The Association was formed in 1973 with the support of UNESCO. During the 36 years of development, however, the economic situation drastically changed among the member countries and AEESEAP must seek for new approach to achieve the aims and goals established at the beginning. The Executive Meeting held in Tokyo in 2008 was a turning point to adjust the AEESEAP activities to cope with new development. Accreditation of engineering education program is very important issue internationally, and AEESEAP decided to have a workshop towards one of the international accreditation program, Washington Accord. This paper describes the workshop held in May, 2010 in Manila, Philippines.

Keywords: Washington Accord, Accreditation, Engineering Education, Asia, Pacific

1. Foundation and historical development of AEESEAP

The historical review and future plans in order to cope with the new situation have been well described by former presidents of AEESEAP, Nasrudin Abdul Rahim [1] and R. M. Hodgson [2] at the JSEE Annual Conference of 2006 and 2007 respectively. Then further development of AEESEAP activity in 2008 was described by Fujita [3] at the JSEE Annual Conference of 2009.

AEESEAP was founded as the outcome of a UNESCO regional seminar on New Approaches to Engineering Education in Asia held in Kuala Lumpur in March 1970. During the seminar it was recommended that a permanent organization for engineering education for the South East Asian region should be formed. Subsequent action by UNESCO and the World Federation of Engineering Organizations (WFEO) led to the formation of AEESEA, the Association for Engineering Education in South East Asia.

The inaugural meeting of AEESEA was held at the College of Engineering, University of the Philippines in Manila during October, 1973 in conjunction with the UNESCO regional seminar on Education, Industry Cooperation and Training. In the Executive meeting held in Seoul in 2001, this organization changed its name to the Association for Engineering Education in Southeast and East Asia and the Pacific with the acronym AEESEAP, to better represent the region occupied by the member countries. The change of name became retroactively effective as of 1989.

During the 36 years of AEESEAP history, there was rapid industrialization and surge of prosperity of several AEESEAP nations. The development was, however unfortunately not uniform and we must have new approach to attain the aims and objectives set at the establishment of AEESEAP. The constitution of AEESEAP was significantly amended as proposed at the 20th Executive Committee meeting held at Manila on May 21, 2010 and final revision of the constitution appeared on July 7, 2010.

2. Activity of AEESEAP since 2000

As reported by Fujita [3], activity of AEESEAP was declining since 2000 and the 8th Triennial conference to be held in 2006 was cancelled. At the 2007 executive meeting, representatives from Brunei, China, Japan, Malaysia and New Zealand resolved to restore the AEESEAP to full activity. R. M. Hodgson, President of AEESEAP at that time decided to have an executive committee meeting with substantial attendance to restore the full activity and JSEE (Japanese Society for Engineering Education) and Nihon University in Tokyo provided assistance and meeting location arrangements.

The 18th Executive Committee Meeting of AEESEAP was held on September 2-3, 2008 at the campus of College of Science and Technology, Nihon University, Tokyo. Eleven voting members out of 15 have attended the meeting. During the meeting, possible futures for the Association were discussed. One of the main issues raised was a strong interest for international accreditation systems for engineering education, particularly the Washington Accord [4].

The Washington Accord is an international agreement among bodies responsible for accrediting engineering degree programs. It recognizes the substantial equivalency of programs accredited by those bodies and recommends that graduates of programs accredited by any of the signatory bodies be recognized by the other bodies as having met the
academic requirements for entry to the practice of engineering. The following AEESEAP member countries have been approved as full signatory member, Australia (1989), New Zealand (1989), Japan (2005), Singapore (2006), Korea (2007) and Malaysia (2009). The request for assisting to develop OBE, Outcome Based Education systems, was made by Brunei Darussalam, Fiji, Papua New Guinea and The Philippines.

At the 19th Executive Committee Meeting held in Seoul, Korea in August 2009, Professor Guevara, the representative of The Philippines proposed to arrange a workshop towards Washington Accord in Manila in May 2010. UNESCO recovered its activity for AEESEAP and Dr. Nakata in UNESCO Jakarta office attended the meeting and expressed support for the workshop. The proposal was accepted at the meeting and the preparation of the workshop started mainly by a local committee headed by Prof. Guevara.

3. Workshop objectives

The objectives of the workshop are as follows:

- To help non-signatory countries to the Washington Accord formulate the steps needed for each country to apply.
- To help college officials figure out the curricular revisions, programs and facilities needed to comply with the requirements of the Accord
- To help existing accreditation groups to shift to the Washington Accord accreditation system

The expected participants are engineering college and university officials and faculty members, and representatives of engineering accreditation bodies.

4. Program of the workshop

In order to achieve the objectives of the workshop, well experienced persons for the application of Washington Accord were invited. Prof. Robin King from Australia gave 4 hours and Dr. Lock, Kai Sang gave 3 hours presentations as follows. The workshop was supported by COMSTE, College of Engineering, University of Philippines and UNESCO in addition to the main body AEESEAP.

May 20, 9 am to 5 pm
- Opening Remarks by Prof. Hong Gao (President, AEESEAP)
- Welcome Remarks by Prof. Rowena Cristina L. Guevara (2nd Vice-President, AEESEAP)
- Introduction to the Workshop by Prof. Hajime Fujita (1st Vice-President, AEESEAP)
- Description of the International Accreditation Bodies and their Inter-relationships by Dr. Reynaldo B. Vea (President of Mapua Institute of Technology & former President of AEESEAP)
- The Washington Accord Accreditation Requirements by Prof Emeritus Robin King (Chair of Engineers Australia Accreditation Board)
- Designing Outcomes-based Engineering Curricula by Prof Emeritus Robin King (Chair of Engineers Australia Accreditation Board)
- Open Forum & Discussion

May 21, 9 am to 12:30 pm
- Preparing for Program Accreditation and the Route to WA Full-signatory by Dr. Lock, Kai Sang (Past Chairman of Engineering Accreditation Board, Singapore)
- Open Forum and Discussion

5. Move for international accreditation of engineering education

In order to promote the mobility of engineers, level of engineering education must be standardized among countries/economies. Certificate of Professional Engineer (PE) is now recognized as an important certificate with the increase of international activities, or globalization started remotely with the ‘Collapse of the Cold War’ and directly with the establishment of WTO and APEC. Membership of international accreditation accord such as WA will provide greater assurance to students that their degree will be recognized among the member nations of that accreditation accord. At the beginning of the workshop, Fujita [4] and Vea [5] gave reviews on overall activities for international accreditation of the engineering education as follows.

5.1 International Engineering Alliances, IEA [6]

There are six international agreements governing mutual recognition of engineering qualifications and professional competence. Three of them, named Accords, concern engineering education and other three, named Agreements, are for practicing engineers. Operation of IEA was also given by King in this workshop [9]. Three Accords for Engineering Education are as follows.

- The Washington Accord signed in 1989 was the first - it recognizes substantial equivalence in the accreditation of qualifications in professional engineering, normally of four years duration. It was founded in 1989 by 6 accreditation bodies representing six countries. An accreditation body in a country/economy must apply for the
Provisional Member at first and be promoted to Signatory members. Since then the following countries have been accepted as members.

**Signatory Members:**
- Australia, Canada, Ireland, New Zealand, United Kingdom, United States (1989)

**Provisional Members:**
- Germany, India, Pakistan, Russia, Sri Lanka, Turkey

- **The Sydney Accord** commenced in 2001 and recognizes substantial equivalence in the accreditation of qualifications in engineering technology, normally of three years duration.
- **Signatory Members:**
- **Provisional Members:**
  - Korea.

- **The Dublin Accord** is an agreement for substantial equivalence in the accreditation of tertiary qualifications in technician engineering, normally of two years duration. It commenced in 2002.
- **Signatory Members:**
- **Provisional Members:**
  - Korea, New Zealand, United States.

Three Agreements for practicing engineers are as follows.

- **APEC Engineer** agreement commenced in 1999.
  This has Government support in the participating APEC economies.
- **Engineers Mobility Forum** agreement commenced in 2001.
  It operates the same competence standard as the APEC Engineer agreement but any country/economy may join.
- **Engineering Technologist Mobility Forum** agreement was signed by participating economies/countries in 2003 to establish a mutual recognition scheme for engineering technologists.

The signatories of the 3 Accords and 3 Agreements meet at the annual IEA meeting to discuss evolving matters of importance and between annual conferences IEA members undertake studies on other networks for international accreditation for engineering education.

5.2 Movement in Europe

In Europe, the movement started by the Bologna Declaration in 1999, for making academic degree standards and quality assurance standards more comparable and compatible among European higher education institutions. It is named after the place it was proposed, the University of Bologna in the Italian city of Bologna, with the signing of the Bologna declaration by Ministers of Education from 29 European countries in 1999.

This movement is called “Bologna Process” and it is said in the EC home page as follows [7].

The Bologna Process aims to create a European Higher Education Area by 2010, in which students can choose from a wide and transparent range of high quality courses and benefit from smooth recognition procedures. The Bologna Declaration of June 1999 has put in motion a series of reforms needed to make European Higher Education more compatible and comparable, more competitive and more attractive for Europeans and for students and scholars from other continents. Reform was needed then and reform is still needed today if Europe is to match the performance of the best performing systems in the world, notably the United States and Asia.

The Bologna Process has been developed into EUR-ACE project, which aims at setting up an European system for accreditation of Engineering education, with the following main aims: provide an appropriate “European label” to the graduates of the accredited educational programs, improve the quality of educational programs in engineering, facilitate trans-national recognition by the label marking, facilitate recognition by the competent authorities, in accord with the EU Directives and facilitate mutual recognition agreements. The EUR-ACE will be described in detail by Professor Borri in the Plenary Session of this conference [8].

5.3 Movement in Asia

While the activity of AEESEAP was low around 2005 – 2007, two organizations to promote international accreditation were formed. These are Engineering Education Working Group in FEIAP, The Federation of Engineering Institutions of Asia and the Pacific, and the NABEEA, Network of Accreditation Bodies for Engineering.

The FEIAP is an international non-profit organization for Professional Engineers founded on 6 July 1978 and its members societies are mostly institute of PE representing each country/economy. The members of NABEEA are naturally the accreditation body of each country/economy. Member list of AEESEP, FEIAP and NABEEA is shown in
Table 1. This is the fact that we have 3 associations in Asia, for promoting accreditation of engineering education. In some countries, one organization represents three associations and in some countries, two or three different organizations represent each corresponding association. We do not know at this moment, how to deal with these 3 associations in future, but involvement of UNESCO will be a key issue because financial support for developing countries by UNESCO will be very important factor to proceed the way to join Washington Accord.

Table 1. Membership list for 3 Associations

<table>
<thead>
<tr>
<th>Country</th>
<th>AEESEAP</th>
<th>FEIAP</th>
<th>NABEEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Engrs Australia</td>
<td>Engrs Australia</td>
<td>Board of Accr. For Eng. &amp; Tech. Education</td>
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<tr>
<td>Bangladesh</td>
<td></td>
<td></td>
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<tr>
<td>Brunei Darussalam</td>
<td>Inst. Tek. Burnei</td>
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<td></td>
</tr>
<tr>
<td>China</td>
<td>CACEE</td>
<td>China Assoc. of Sci. &amp; Tech.</td>
<td></td>
</tr>
<tr>
<td>Fiji</td>
<td>Fiji Inst. Tech.</td>
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<td></td>
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<tr>
<td>Hong Kong</td>
<td>Inst. of Engrs Indonesia</td>
<td>Hong Kong Inst. of Engineers</td>
<td></td>
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<tr>
<td>Indonesia</td>
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<td></td>
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<tr>
<td>Japan</td>
<td>JSEE</td>
<td>Inst. Prof. Engrs. Japan</td>
<td>JABEE</td>
</tr>
<tr>
<td>Korea</td>
<td>KSEE</td>
<td>Korea Prof. Engrs. Assoc.</td>
<td>ABEEK</td>
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<tr>
<td>Lao PDR</td>
<td>Cent. for Communication &amp; Transport</td>
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<td>Mauritius</td>
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<td>Myanmar</td>
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<td>New Zealand</td>
<td>IPENZ</td>
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<td>Pakistan</td>
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<td></td>
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<tr>
<td>USA</td>
<td>ASEE (Ordinary mem.)</td>
<td>ASEE</td>
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</tr>
</tbody>
</table>


The main purpose of this workshop is to show the way to join the Washington Accord in detail. King and Lock gave lectures for this purpose based on their experiences. This paper is not to report the details of the presentation, but its outlines will be given in Chapters 6 to 8 here and below.

King started his presentation with the operating context of WA in relation to IEA, and presented operational mechanism of Engineers Australia and ABET in USA. He concluded with four defined mechanisms for AW signatories to help prospective accreditation authorities as follows.

**Mechanism 1: Mentoring**

The applicant, an established accreditation authority aspiring to become WA signatory, requests the IEA Secretariat to have the Accord Committee assign 2 – 3 mentors from full signatories of the Accord. The mentors act for the Accord (not their own authorities) and free and full disclosure of relevant information is expected between applicant and mentor.

**Mechanism 2: Private Mentoring**

A professional recognition/accreditation body may directly approach a signatory for membership support. The use of this private mentoring mechanism would normally precede formal Accord supported mentoring mentioned above. The Accord, however, does not accept any responsibility for the quality of advice.

**Mechanism 3: Support and Accreditation Service**

For economies without an established authority for the accreditation of engineering education programs, individual education providers may request accreditation services from a signatory under certain circumstances. It is expected that the signatory would be that geographically closest to the non-Accord economy.

**Mechanism 4: Consultancy**

A professional recognition/accreditation body may contract (for fees) consulting services to assist them in development of accreditation systems and qualification standard.

7. Designing Outcome-based engineering curricula [10]

King’s presentation may be summarized as follows.
Designing outcome-based curricula is a core of the engineering education. The demands on engineering education are continuously increasing. Engineering problems, however, are not straight forward and educators don’t necessarily use the most suitable approaches. His conclusions are:

- Good program and unit design is enhanced by taking an engineering approach.
- The outcome specification matrix is a powerful tool to build programs and units.
- Collaborative program and unit design improves and optimizes learning outcomes and assessment.
- Involve industry stakeholders in the curriculum and seek for mutual benefits.
- Understand students and listen to feedback.
- Seek cultural change to increase the authenticity of engineering educators with respect to best-practice learning.
- Support development of networks of educators.


Lock’s presentation was divided into three parts.

- **Part 1 - Singapore’s experience in becoming Signatory of the Washington Accord.**
  
  He presented the establishment of EAB (Engineering Accreditation Board, Singapore) and experience of path to become WA signatory. EAB had many challenges faced and the way to overcome those challenges were presented.

- **Part 2 - Program evaluation, accreditation visit, selection & training program evaluators.**
  
  Program evaluation process includes pre-visit, Accreditation visit (campus visit) and post visit activities. Major focus and preparation processes are fully described for each visit activity. Topics included teaching-learning processes, achievement of program outcomes, curriculum, faculty, facility and learning environment, institutional support and finance, governance and interaction between institution and industry.

- **Part 3 – Preparing for program accreditation benchmark to WA level.**
  
  This part summarized the experience of Singapore to attain full signatory of WA by discussing the meeting the accreditation criteria, preparation of self-study materials and preparation for accreditation visit.

9. Summary

Accreditation of engineering programs has been one of the most important issues on the agenda of AEESEAP. Organizing a workshop on this subject was decided at the 18th executive committee meeting of AEESEAP held in Tokyo in 2008. The Workshop on Washington Accord Accreditation was held at Pearl Hall, SEAMEO Innotec, Metro Manila, Philippines on May 20 and in the morning of May 21, 2010. Attending the workshop were 65 local participants (from 20 universities, 2 accreditation organizations and 1 professional organization in Philippines) and 11 international participants (from Australia and New Zealand, Indonesia, Japan, Korea, Malaysia, Papua New Guinea, Philippines, PR China, Brunei Darussalam, and Singapore). Professor Emeritus Robin King (Chair of Engineers Australia Accreditation Board) and Dr. Lock, Kai Sang (Past Chairman of Engineering Accreditation Board, Singapore) were invited to give lectures. They introduced the Washington Accord accreditation requirements and showed in detail how to design a curriculum to meet such requirements and how to go through the accreditation procedures. Professor Hajime Fujita, first vice president of AEESEAP, and Professor Reynaldo B. Vea, President of Mapua University and former president of AEESEAP, introduced international accreditation bodies. Many important issues related to accreditation were discussed. The workshop turned out to be very informative and successful.

Acknowledgement

Thanks are due to Professor Robin King and Dr. Lock, Kai Sang for detailed presentation for the preparation to join Washington Accord. Thanks are also due to the local committee members to prepare and support of the workshop and to Congressional Commission on Science & Technology and Engineering (COMSTE) and to United Nations Education, Science, Culture Organization (UNESCO).and to College of Engineering, University of Philippines for support of this workshop.

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Biography

Dr. Hajime Fujita received B.E. and M. E. degrees from the Department of Mechanical Engineering, Nihon University in 1965 and 1967 respectively, and received Ph. D degree from The Johns Hopkins University in 1971. After serving as a Post Doctoral Fellow at JHU and a Visiting Assistant Professor at the Illinois Institute of Technology, he returned to Japan in 1975 and worked at the Mechanical Engineering Research Laboratory, Hitachi, Ltd., serving as a Senior Scientist and a Chief Scientist, mainly engaged with the aerodynamic noise control, as well as in-house CEE among Hitachi Group companies. He was appointed as an East Japan Railway Professor at the Tokyo Institute of Technology from October 1992 to March 1995. He was appointed as a Professor at the Department of Mechanical Engineering, Nihon University in April 1995 and served until March 2008 when he retired. He was elected as the Director for International Affairs of JSEE in 2000 and served until May 2010. He served as a Council Member of IACEE (International Association for Continuing Engineering Education) from 2001 to 2008. He was the General Chairman of the 9th WCCEE (World Conference for Continuing Engineering Education) held in Tokyo in 2004. He was elected as the 1st Vice President of AEESEAP in 2008. He is now serving as a Professor of Research Institute of Science, Nihon University since April 2008.