
Asia-Pacific
Economic Cooperation

# Research Report
# The International Seminar
# “Development of Engineering Professionals in APEC Economies”

**APEC Industrial Science and Technology Group**

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# IST 06 11A Project Research

## The International Seminar
## “Development of Engineering Professionals in APEC Economies”

### Introduction

On the threshold of Summit APEC-2012 (Russkiy Island, Vladivostok) the International Seminar «Development of Engineering Professionals in APEC Economies» was held. Among the organizers were Tomsk Polytechnic University, Association for Engineering Education of Russia, Monitoring Committee of APEC Engineers, Ministry of Education and Science of the Russian Federation, Ministry of Economic Development and Trade of the Russian Federation and APEC International Secretariat.

The representatives of the following APEC economies took part in the event: Japan, Korea, Malaysia, New Zealand, Chinese Taipei, and Viet Nam. Russia as a host economy featured specialists from Russian universities, industrial enterprises and engaged authorities.

The research aims at studying the common issues of international recognition of engineering education and profession, the engineering programs accreditation, engineering mobility challenges and their solutions. The accent is made on the experience of Japan, Korea, New Zealand, the Philippines, Chinese Taipei, and Viet Nam. Additionally an attempt was made to work out the sample regulations for the activity of National Monitoring Committee of APEC Engineers.

The topics, articles and presentations of Russian and international participants of the Seminar «Development of Engineering Professionals in APEC Economies» served as a basis for the given research. A set of regulatory documents was developed specifying the establishing and functioning of the national system for certification and registration of professional engineers in APEC Engineer Register. This set of documents can fix the frames for creation of internationally recognized system for professional engineer certification and registration in any APEC economy. The set of documents was developed by the task team and discussed during the Seminar. The Assessment Statement provides a framework for the assessment of professional engineers for placement on the APEC Engineer Register by National Monitoring Committee of APEC Engineers.

## Common issues of international recognition in the field of engineering education and profession

Engineering education and engineering practice in the economy have been transforming towards becoming increasingly globalised in the last five to ten years as the roll of engineers came up with the development of science and technology.

The professional engineer system is one of the systems to keep the society safe and healthy. However it does not work properly if engineers are not well educated and their qualification is not adequate. The following articles reflect the points of view of international enterprises, universities and other stakeholders concerning the up-to-date situation on the world educational engineering market as a whole and in APEC economies in particular.

### *APEC engineer register, challenges and the way forward to promote mobility of engineering services (by Ir. Dr. Gue See Sew, Malaysia)*

In his article Ir. Dr. Gue See Sew considers Association of South East Asian Nations (ASEAN) engineering registration model and notes that in the public the fostering of engineering mobility in ASEAN started after the signing of ASEAN Free Trade Area (AFTA) in 1992.

The framework of Mutual Recognition Arrangement (MRA) of Engineering Services to support AFTA was later signed in 2005 which spells out the requirements for cross-border practice of professional engineering consultancy services for various engineering works. The objectives of the MRA are as follows:

a) To enhance cooperation in services amongst Member States in order to improve the efficiency and competitiveness, diversify production capacity and supply and distribution of services of their suppliers within and outside ASEAN;

b) To eliminate substantial restrictions to trade in services amongst Member States; and

c) To liberalise trade in services by expanding the depth and scope of liberalisation beyond those undertaken by Member States under the GATS with the aim to realising a free trade area in services.

The following Figure 1 shows the slow growth of the APEC Engineers for the last 10 years as one of the criteria to qualify for APEC Engineer is having license International Engineer Register and certificate to practice independently.

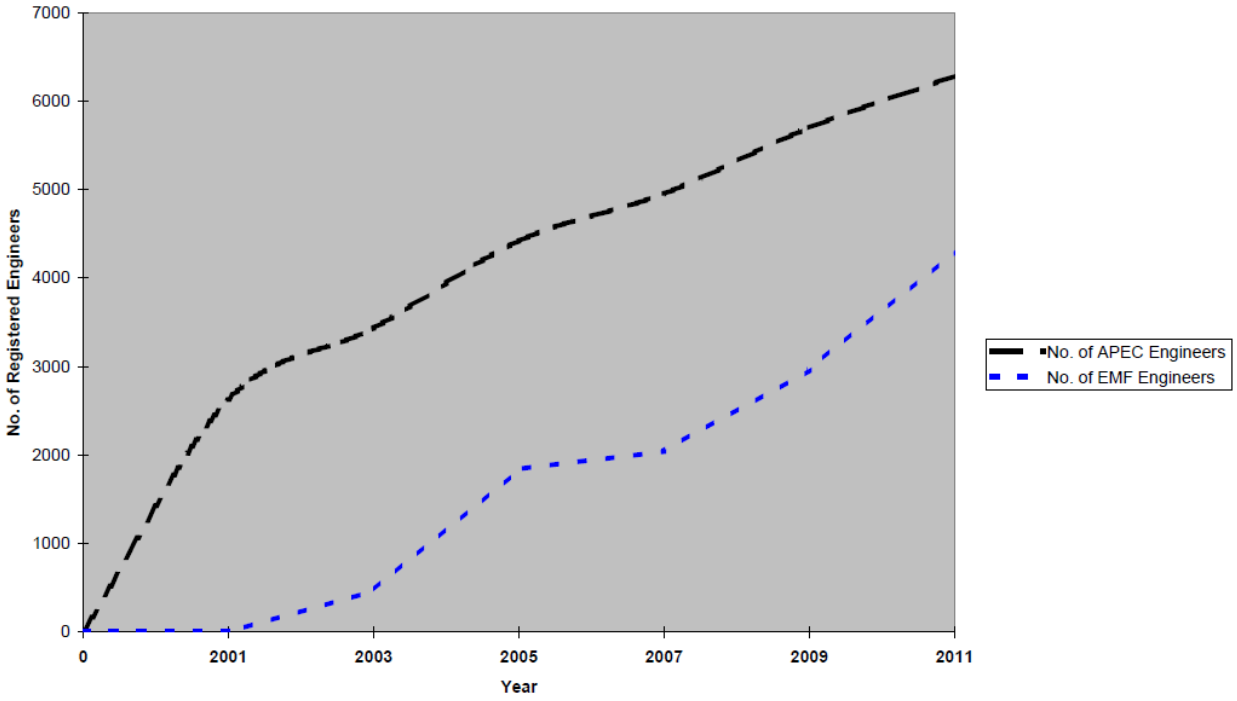



Figure 1

In terms of ratio, EMF International Professional register covers areas with much bigger population but has fewer registered professional engineers in the register. The main reason to this is the involvement of APEC Economic Ministers in the APEC Engineer.

In the case of Malaysia, the number of professional engineers licensed to practice independently is 10,423 which is less than 15% of the total registered engineers with the Licensing Board, Board of Engineers Malaysia as at April 2012. Thus, the mobility of licensed professional engineers is generally small in comparison with the total population of engineers.

The author notes that the APEC Engineer Register should be promoted as the recognised register in the MRA for bilateral or multilateral trade negotiations between APEC economies. Thus, representatives of APEC Engineer Registers should work with their respective government agencies in charge of trade negotiation to promote APEC Engineer Register as the MRA. This will provide the impetus to expedite trade in engineering services.

The benefits of APEC Engineers include:

1) Benchmark of achievement of Professional engineers,

2) Migration of the imbalance of demand and supply of engineers within countries in the region,

3) Better use of technology and resources,

4) Technology transfer,

5) Common code of practice and standard for the regional with national annex to suit each national need and affordability while maintaining the minimum standard of the regional for trade purpose.

The way forward to achieve the full potential of the APEC Engineer on mobility of engineers is to integrate benchmarking and trade negotiation through public and private

partnership together with the input professional bodies such as Institution of Engineers and licensing or certification board of engineers for practice.

### *Engineering Education and Professional Qualification in Japan (by Prof. Itsuo Ohnaka, Japan)*

Prof. Ohnaka discerns two types of national qualification of professional engineers; one is called *Gijutsushi* in Japanese or Professional Engineer, Japan (P.E.Jp) in English and the other is *Kenchikushi* in Japanese or Architect and Building Engineers in English. The qualifications are based on the *Gijutsushi* and *Kenchikushi* Laws, respectively. Currently, only *Gijutsushi* and 1st-class *Kenchikushi* are eligible to apply the APEC Engineer (APEC P.E.Jp) and EMF International Professional Engineer (Int.P.E.Jp).

JABEE (Japan Accreditation Board for Engineering Education) has been launched in November of 1999 and was accepted by the Washington Accord (WA) as a provisional member in 2003 and a regular member in 2005.

The problems the Japan faced in the initial stage of establishing the accreditation system were as follows:

1) Understanding and dissemination of concept such as quality assurance of education, accreditation and outcomes,

2) Evaluation methods of outcomes,

3) Training of examiners,

4) Lack of understanding of profession and engineering,

5) Fixed idea that university should teach truth and scholarship or theory and should not be vocational one,

6) Belief that their quality is high enough.

To solve these problems many people were sent to WA countries to attend workshops and accreditation visiting as observers, and held symposiums and workshops inviting lecturers from ABET or other foreign organizations.

Also to cope with such international movement committees were created to establish accreditation system and reform the PE act in order to establish substantially equivalent systems to other countries.

Unlike many other countries such as Australia, the accreditation body in Japan (JABEE) is independent from the IPEJ. Namely, JABEE is an independent public organization just like ABET in the USA.

The engineering qualification system in Japan including accreditation system of engineering education is substantially equivalent to the Washington Accord member countries and has hoped to increase the number of professional engineers with good education and training. However, there are the following problems now:

1) The concept of PE is still not so popular. Although the number of professional engineers is much lower than expected (Figure 2).

2) The number of registered APEC engineers is decreasing recently as shown in (Figure 3).

3) Mobility of engineers is still small.

4) The number of accredited programs is saturating. The reasons are as follows:

4.1) The people in higher education think that the institutional accreditation is sufficient enough and do not understand the necessity of the program accreditation. The institutional accreditation became mandatory since 2004 for every higher education institution. The purpose and effect of these two accreditations are different and independent. Faculties still do not understand the meaning of program or professional accreditation.

4.2) They say that quality assurance of the minimum level is not provided.

4.3) Accreditation hinders progress because of stiff regulation and control.

These are a kind of misunderstanding and now JABEE is encouraging to change the current education with asking to show evidence together with outcomes evaluation when they have been keeping the conventional education.

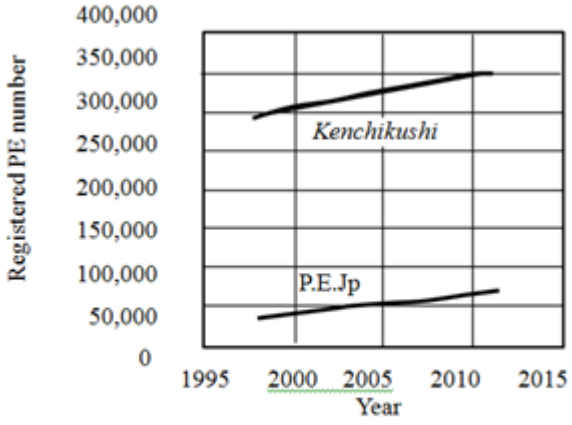



Figure 2 Change in numbers of registered P.E.Jp and Kenchikushi

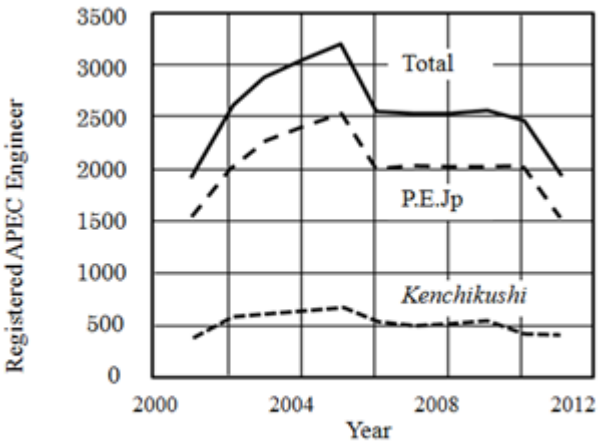



Figure 3 Change in number of registered APEC engineers

Prof. Ohnaka reckons that the very best way to solving the problems related to professional engineer system is education, so-called holistic approach to realize safety. Just the trustworthy professionals like professional engineers have responsibility for that.

***Experiences in Engineering Education and Professional Practice in the Philippines***
***(By Mr. Federico A. Monsada, Philippines)***

The Mr. Monsada's paper deals with the experiences in engineering education and engineering practice in the jurisdiction to achieve and maintain globally-competitive graduate and professional qualifications.

The particularity of the Philippine educational system is higher education, especially private higher education, is a closely regulated industry. Private institutions must obtain permits from the Commission on Higher Education (CHED) to be able to offer new educational programs. The final recognition of the new programs is granted only after three years of operation.

Quality assurance system for higher education in the economy has been substantially provided also by the CHED, the accrediting agencies, and the Professional Regulation Commission.

In expectation of opening up of the ASEAN Economic Community in 2015, the sectors like the manufacturing, food, construction, semi-conductor and electronics, engineering services, energy, and the mining and metals industrial sectors boost further demand for

engineering services not only from among the region's industries but even from those non-ASEAN entities who are preparing to provide services to or invest in the region.

However, the increasing demand for engineers and the need for global quality of engineering works in these areas of professional practice, have triggered inquiries from professional engineers for qualifications assessment and recognition such as those implemented in the various registers such as the APEC Engineer Register, the ASEAN Engineering Register, and the like. This is invariably the trend and the direction to choose in order to increase one's professional mobility in the global practice of engineering.

The professional engineers are required to undergo continuing professional education (CPE) with at least 60 units over a period of three years, prior to re-registration at the end of the 3-year period. To further strengthen the faculty base of the various educational institutions in the Engineering Research and Development for Technology (ERDT) was established. The ERDT is a consortium of seven universities in the economy that offer mature master`s and doctoral degrees in various engineering fields: University of the Philippines-Diliman, De La Salle University, Mapua Institute of Technology, Ateneo de Manila University, Mindanao State University Iligan, University of San Carlos, and Central Luzon State University. ERDT Funding comes from the Department of Science and Technology.

The Philippine Technological Council, being the focal point of the various advocacies of engineering professionals in the economy, is in the midst of all of these. And to effectively do this its daunting task, PTC continually seek to network with its fellow professional engineering bodies around the world and benchmark its practices as regards engineering education and practice.

***Roles and objectives of APEC Engineers Register and Current Status of Engineers' Mobility in the APEC Economies (by Dr. Za-Chieh Moh, the Republic of China)***

The author pays attention to a team approach in sharing knowledge, experience, values, and code of ethics in conducting professional activities that can be beneficial in maximizing the contribution of engineering, and encouraging accountability for ensuring the well-being of the society.

Including APEC Engineer, there are 6 international agreements governing mutual recognition of engineering qualifications and professional competences. There is short information about each of them but special attention is given to APEC Engineer. As of September 2011, there are 14 economies and many observers partaking in APEC Engineer.

Table 1. The official name and representative of each economy maintaining APEC Engineer Register

| *Economy* | *Represented by* | *Year* |
|---|---|---|
| Australia | Engineers Australia | 2000 |
| Canada | Engineers Canada | 2000 |
| Hong Kong, China | Hong Kong Institution of Engineers | 2000 |
| Indonesia | Persatuan Insinyur Indonesia | 2001 |
| Japan | Institution of Professional Engineers Japan | 2000 |
| Korea | Korean Professional Engineers Association | 2000 |
| Malaysia | Institution of Engineers Malaysia | 2000 |
| New Zealand | Institution of Professional Engineers NZ | 2000 |
| Philippines | Philippine Technological Council | 2003 |
| Russia | Russian Association for Engineering Education | 2010 |
| Singapore | Institution of Engineers Singapore | 2005 |
| Chinese Taipei | Chinese Institute of Engineers | 2005 |
| Thailand | Council of Engineers Thailand | 2003 |
| United States | National Council of Examiners for Engineering and Surveying | 2001 |

Different economies have different approaches to what the APEC Engineer designation is and how it can be used. Details of equivalence between different disciplines, scopes of practice, or even simple nomenclature will have to be discussed during bilateral or multilateral discussions on mobility.

In the paper the following conclusions were drawn:

- The APEC Economic Leaders need to take proactive steps providing analytical, rigor and academic strength to the process of mutual recognition of APEC Engineers (academic as well as professional)
- The ASEAN Mutual Recognition Arrangement (MRA) on Engineering Services provides a potential model for future actions
- Development of the APEC region as a whole will be different once receiving significant contributions from fellow member economies

To identify current issues and to monitor progress in mobility among APEC economies, a questionnaire was prepared in April 2012. It was then mailed to APEC member economies for input. 10 members had replied by the pre-determined deadline on 7 May 2012. There were four questions included in the questionnaire.

Q1: What is the current status of engineers' mobility in your Economy?

Q2: Does your Economy have any multi-lateral or bi-lateral agreement with other Economy on: (a) APEC Engineer (b) EMF Engineer (c) Others?

Q3: Referring to Question 2, are there any discussions on-going on the subject of mutual recognition of Professional Engineers? If yes, with which Economy are these discussions held?

Q4: What are the main issues in your Economy which prevent progress of engineers' mobility? How can we overcome them? Results obtained from the Questionnaire in May 2012 are shown in Table 2.

Table 2. Results obtained from the Questionnaire in May 2012

| | | *AUS* | *CAN* | *C-T* | *HK* | *JAP* | *KOR* | *NZ* | *MAL* | *RUS* | *SIN* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Q1 | membership | APEC<br>EMF<br>WA | APEC<br>EMF<br>WA | APEC<br>EMF<br>WA | APEC<br>EMF<br>WA | APEC<br>EMF<br>WA | APEC<br>EMF<br>WA | APEC<br>EMF<br>WA | APEC<br>EMF<br>WA | APEC<br>EMF | APEC<br>EMF<br>WA |
| | Statues | | - | - | - | slow | APEC No. grow | - | APEC No. grow | APEC No. grow | APEC No. grow |
| Q2 | a | KOR | No | No | Note1 | AUS | AUS | No | AUS | No | No |
| | b | No | No | No | No | No | No | No | No | No | No |
| | c | No | No | No | No | No | No | No | No | No | No |
| Q3 | | KOR | No | No | CHI | No | US | AUS<br>UK | No | No | No |
| Q4 | | Unregulated Status | Domestic Unification | Legislative | Local laws | Legal and language | Not mandatory | Unbalance requirement | Lack of incentive | No govern. support | Unbalance of benefits |

Note: 1. AUS, CAN, IRL, NZ, UK, CHI

***The Development of APEC Engineer in an International Context***

***(By Mr. Basil Wakelin, New Zealand)***

In his article Mr. Wakelin examines where the APEC Engineer agreement has got to, investigates also where engineering mobility is going and how APEC Engineer might develop in the future.

Based on the Review Report submitted by the 14 economies in June 2011, there are a total of 6,004 APEC Engineers registered in 24 different fields of practice.

The numbers of APEC Engineers allows resuming that aggregate number of APEC Engineers in the economies is quite small. It could perhaps indicate that:

- Engineers perceive that the agreement is of limited value or

- There is a lack of practical recognition by members and governments or
- Bilateral agreements have dealt with issues between the most significant trading partners and undermined the APEC engineer agreement or
- It has been inadequately marketed or
- The processes to achieve APEC Engineer are too difficult/time consuming or costly or
- The status as an APEC Engineer is not differentiated so as to add perceived value or
- Lack of complete trust between members or
- Other reasons or combination of reasons.

Drivers examined in the article can be Personal (experience, job prospects, recognition, cultural, travel), Supply economy (poor job prospects, experience, fostering connections) and destination economy (skill shortage, requirement for new expertise, technical links etc.) The drivers are various and differ in all economies.

What concerned future development of APEC Engineer the certain improvements can be made. Chair IEA Governing Group proposes the following:

Firstly, by adopting clear and unequivocal educational and professional competence standards such as those of the IEA.

Secondly, by adopting more rigorous evaluation for admission and review processes.

Thirdly, by stronger marketing of this standard to the APEC members and governments so that at the end the ultimate engendering of trust between the AEPC nations may result in significantly enhanced ease of mobility for all our engineers.

The future developments can be summarized as:

- Clear education and professional competency standards;
- Rigorous evaluation for admission and review;
- Simplify the process for individuals;
- Increase the trust in the standards and processes;
- Eventually certification of whole systems rather than individuals.


# ASSESSMENT STATEMENT

2012

## Introduction

*The APEC Engineer Register*

The APEC Engineer Register was established by the International Organization for Asia Pacific Economic Cooperation (APEC) to ensure professional mobility of engineers in member economies (the USA, Canada, China, Japan, Australia, Russia, etc.).

Registration of engineers in the APEC Engineer Register is carried out on the basis of The APEC Engineer Manual approved by the APEC Engineer Coordination Committee, and entails recognition of their competencies meeting international standards and complying with the APEC Engineer Agreement.

*Objectives of APEC Engineer Register*

Objectives of the system of certification and registration of National engineers in the APEC Engineer Register include the following:

- development of engineering education and engineering profession in economy and enhancement of their attractiveness,
- improvement of quality of graduates' education and training within engineering programs in National Higher Educational Institutions (HEIs),
- promotion of continuing professional development and improvement of professional competencies among practicing engineers,
- education and training of highly qualified engineers for further development of national economy,
- support of international prestige, competitiveness and mobility of National engineers.

This document regulates certification and registration of individuals involved in practical engineering activity in the National Register of APEC Engineers and international APEC Engineer Register.

*Purpose of Assessment Statement*

The Assessment Statement provides a framework for the assessment of professional engineers for placement on the APEC Engineer Register by National Monitoring Committee of APEC Engineers.

## Part A: The Monitoring Committee

*Objective of National Monitoring Committee*

National Monitoring Committee of APEC Engineers (Appendix 1) is created to manage the system of certification and registration of practicing engineers in the National APEC Engineer Register and the International APEC Engineer Register in compliance with The APEC Engineer Manual.

*National Monitoring Committee of APEC Engineers members*

Members of the National Monitoring Committee of APEC Engineers are listed in Appendix 13.

## Part B: The Assessment Statement

*Terms and Definitions*

*Practical engineering activity* is an activity related to the solution of engineering problems, carried out by the individual with higher education degree awarded in the relevant engineering discipline.

*Engineering Disciplines* are areas of practical engineering activity in compliance with *The APEC Engineer Manual* and approved by the National Monitoring Committee of APEC Engineers (Appendix 2).

*APEC Engineer* is an individual involved in practical engineering activity, assessed, certificated and registered with regard to criteria and procedures of *The APEC Engineer Manual* and approved by the National Monitoring Committee of APEC Engineers.

*Evaluation* is stating compliance of indicators of engineering practice with the requirements of the APEC Engineer Standard (Appendix 3). The relevant procedures (Appendix 4) agreed upon with *The APEC Engineer Manual* and approved by the National Monitoring Committee of APEC Engineers are applied in the evaluation process. It also includes an examination (Appendix 5) on verification of transferable, professional and special competencies necessary for carrying out practical engineering activity in certain disciplines (Appendix 6).

*Certification* is documented acknowledgement of the compliance of engineering practice indicators with the requirements of the APEC Engineer Standard and its registration followed by standard awarding certificate (Appendix 7).

*Registration* is entering personal records and practical activity indicators of an engineer (Appendix 8), which has proved the compliance with the requirements of the APEC Engineer Standard in the National APEC Engineer Register and the International APEC Engineer Register.

*Suspension and termination of registration* is temporary or final exclusion of personal data and indicators of engineer's practical activities from the National APEC Engineer Register and the International APEC Engineer Register for reasons stated in Appendix 9.

*The APEC Engineer Standard* is a set of requirements to indicators of practical engineering activity and corresponding criteria, including continuing professional development and improvement of transferable, professional and special competencies (Appendix 10), as well as compliance with the Code of APEC Engineer Professional Ethics (Appendix 11) according to *The APEC Engineer Manual* and approved by the National Monitoring Committee of APEC Engineers.

*The organization structure* of certification and registration of individuals involved in practical engineering activity in the National APEC Engineer Register and the International APEC Engineer Register is shown in Appendix 12.

*Certification and registration*

An application form for individuals involved in practical engineering activity on the territory of the National Federation and applying for registration in the National APEC

Engineer Register and the International APEC Engineer Register (further to be referred to as the Applicants) is placed on the National APEC Engineers Register website (Appendix 14).

An applicant fills in and sends an application form to the Secretariat of the National Monitoring Committee of APEC Engineers (further to be referred to as the Secretariat) to the e-mail address of the National APEC Engineer Register, together with electronic copies of accompanying documents confirming indicators of engineering practice and transfers organization fee to the account specified on the Internet-site.

The Secretariat verifies the accuracy of the application form and the complete set of documents of the Applicant and within a week period sends them via e-mail to the APEC Engineer Certification Centre (Appendix 15) where indicators of engineering practice are evaluated and compared against the criteria of the APEC Engineer Standard. If necessary, the Secretariat requests additional documents. In case of non-compliance of documents with the requirements, the Secretariat notifies the Applicant of the cessation of the procedure of certification and registration in the National APEC Engineer Register and the International APEC Engineer Register.

The Certification Centre examines the application form and documents of the Applicant and within a two-week period informs him/her of the venue and possible dates of an examination to check transferable, professional and special competencies of the Applicant. The date and the venue are agreed with the Applicant. In case of non-compliance of documents with the requirements, the Certification Centre sends the Applicant a reasonable refusal to grade an exam.

The Certification Centre sets Examination Boards to check transferable, professional and special competencies of Applicants in various disciplines of engineering activity (further to be referred to as Examination Boards). Examination Boards act on the basis of the List of Transferable and Professional Competencies approved by the National Monitoring Committee of APEC Engineers, formulate requirements to special competencies in various disciplines, twice a year update exam programs schedules which are displayed on the Internet-site of the National APEC Engineer Register. Examinations are taken only in compliance with the programs according to the schedule.

Examination fee is paid directly to the account specified on the Internet-site of the National APEC Engineer Register prior to the examination date or on arriving at the examination venue. Before the examination, the Applicant submits original copies of documents confirming indicators of his/her practical engineering practice to the Certification Centre.

Examination Boards send Applicant’s examination results to the Certification Centre, which with respect to examination and documents assessment results, decides whether engineering practice indicators of the Applicant comply with the APEC Engineer Standard.

The decision of the Certification Centre is approved by the National Monitoring Committee of APEC Engineers. If the decision is positive, personal data and indicators of engineering practice of the Applicant are placed on the Internet-site of the National APEC Engineer Register. The Applicant is given the certificate on awarding him/her the title of APEC Engineer.

Registration in the National APEC Engineer Register and the International APEC Engineer Register is valid within 2 years provided annual registration fees are paid and the personal profile meets the requirements of the APEC Engineer Standard.

In case of annual registration fee delay or failure to comply with the requirements of the APEC Engineer Standard, registration is suspended or terminated, which implies temporary or ultimate exclusion of personal data and indicators of engineering practice from the National APEC Engineer Register and the International APEC Engineer Register.

During the period of registration in the National APEC Engineer Register and the International APEC Engineer Register, the APEC Engineer develops his/her professional qualification and skills and takes training under the programs approved by the Institute of APEC Engineers Professional Development (Appendix 16).

The APEC Engineer is entitled to prolong registration in the National APEC Engineer Register and the International APEC Engineer Register by sending a corresponding application form and documents confirming compliance with the requirements of the APEC Engineer Standard within the period of registration to the National Monitoring Committee of APEC Engineers. Certification and registration is prolonged without examinations following positive evaluation of documents by the Certification Centre upon the decision of the National Monitoring Committee of APEC Engineers.

If the APEC Engineer fails to meet the deadline in submitting the application form for registration prolongation, his/her personal data are excluded from the National APEC Engineer Register and the International APEC Engineer Register.

*Audit of APEC Engineers*

The National Monitoring Committee of APEC Engineers has resolved that any person on the APEC Engineer Register may be subject to random audit by an auditor, accredited by the Monitoring Committee, of their current curriculum vitae and records of continuing professional development over the immediate past three year period.

**Part C: Engineering Disciplines**

Certification and registration of persons involved in practical engineering activity on the territory of the National Federation, in the National APEC Engineer Register and the International APEC Engineer Register according to 12 disciplines (Appendix 2) agreed with *The APEC Engineer Manual.*

**Part D: Assessment Documentation and Report**

The major points of compliance assessment of practical engineering activity indicators with the APEC Engineer Standard is presented in Appendix 4.

**List of attachments**

| | |
|---|---|
| Appendix 1. | Regulation on the National Monitoring Committee of APEC Engineers. |
| Appendix 2. | List of the engineering disciplines to certification and registration of the APEC Engineers in Russia. |
| Appendix 3. | APEC Engineer Standard |
| Appendix 4. | Regulation on evaluation procedure of compliance of practical engineering activity indicators with the APEC Engineer Standard |

Appendix 1

National Monitoring Committee of APEC Engineers

Assessment Statement

**REGULATION**

on the National Monitoring Committee of APEC Engineers

1. The National Monitoring Committee of APEC Engineers (further to be referred to as the Monitoring Committee) is established with participation of representatives of legislative and executive authorities, public and professional organizations, renowned engineers and authoritative leaders of research institutions and industrial enterprises from various branches of national economy, and other interested parties.

2. The Monitoring Committee consists of not less than 10 members, the chairman, the first deputy chairman and the deputy chairman. The chairman and its deputies are elected by the members of the Monitoring Committee. The secretary and the observer to APEC Engineer Coordinating Committee are appointed from members of the Monitoring Committee. The Monitoring Committee is established for the period of 5 years with subsequent rotation of its members and re-election of the chairman and deputy chairmen. In cases when the member of the Monitoring Committee is unable to fulfill his/her obligations, a new member is elected for this position prior to the expiry of the term of his/her predecessor.

3. The chairman of the Monitoring Committee shall ensure its day-to-day operation. Deputy chairmen shall assist the chairman in organizing daily activities of the Monitoring Committee and temporarily fulfill obligations of the chairman when the latter one is unable to perform his/her obligations due to absence, illness or other justifiable reasons.

4. The Monitoring Committee manages the system of certification and registration of individuals involved in practical engineering activity in the National APEC Engineer Register and international APEC Engineer Register in compliance with The APEC Engineer Manual, including the following:

4.1. Makes decisions and approves action plans and documents regulating functioning and development of the system, such as:

- Regulations on certification and registration in the National APEC Engineer Register and International APEC Engineer Register,
- List of practical activities of APEC Engineers in Economy,
- APEC Engineer Standard,
- Regulation on evaluation procedure of practical engineering activity indicators for their compliance with APEC Engineer Standard,

- Regulation on examination of competencies necessary for realization of independent practical engineering activity within the framework of APEC Engineer Standard,
- List of transferable, professional and special competencies corresponding to APEC Engineer Standard,
- Form of APEC Engineer Certificate,
- Form of presenting personal data and indicators of practical activities of the engineer in the National APEC Engineer Register,
- Regulation on suspension and termination of registration of engineer in the National APEC Engineer Register and International APEC Engineer Register,
- Code of APEC Engineer professional ethics,
- Application form for applicants subject to certification and registration in the National APEC Engineer Register and International APEC Engineer Register,
- Regulation on the APEC Engineer Certification Centre,
- Regulation on the Institute of APEC Engineers Professional Development, and others.

4.2. Approves the amount of organization, examination and annual registration fee of APEC Engineers.

4.3. Approves annual budget of the National APEC Engineer Register.

4.4. Approves decisions of the APEC Engineer Certification Centre with regard to evaluation of practical engineering activity indicators for their compliance with APEC Engineer Standard.

4.5. Awards the title of «APEC Engineer» and makes decisions on including personal data and indicators of practical activities of engineers confirmed their compliance with requirements of APEC Engineer Standard in the National APEC Engineer Register and International APEC Engineer Register.

4.6. Defines the Institute of APEC Engineer Professional Development.

5. The Monitoring Committee directly or via the observer cooperates with APEC Engineer Coordinating Committee and national monitoring committees of APEC Engineers in member economies of the International Organization for Asian - Pacific Economic Cooperation.

6. The Monitoring Committee holds its meetings on schedule at least two times a year (once in half-year period). Extraordinary meeting is called at the initiative of the chairman or upon demand of not less than 1/3 members of the Monitoring Committee. Members of the Monitoring Committee are informed on extraordinary meeting not later than 10 days prior to the meeting itself. The agenda of the Monitoring Committee meetings is composed by the Secretariat. The chairman of the Monitoring Committee presides the meeting.

7. Meetings of the Monitoring Committee are held at the presence of not less than 1/2 of its members. Decisions of the Monitoring Committee are made by 2/3 voices of the members present at the meeting. Minutes of the Monitoring Committee meetings are kept in the Secretariat.

Appendix 2

National Monitoring Committee APEC Engineers

Assessment Statement

LIST

of the engineering disciplines

to certification and registration of the APEC Engineers in Economy

Certification and registration of persons involved in practical engineering activity on the territory of the Economy, in the National APEC Engineer Register and the International APEC Engineer Register are implemented according to the following 12 areas agreed with *The APEC Engineer Manual:*

1. Aerospace Engineering
2. Bioengineering
3. Chemical Engineering
4. Civil Engineering
5. Environmental Engineering
6. Electrical Engineering
7. Geotechnical Engineering
8. Information Engineering
9. Mechanical Engineering
10. Mining Engineering
11. Petroleum Engineering
12. Transportation Engineering

Appendix 3

National Monitoring Committee APEC Engineers

Assessment Statement

## APEC ENGINEER STANDARD

1. The APEC Engineer Standard establishes the following requirements for individuals who are involved in engineering activity and appear to be the applicants for certification and registration as an APEC Engineer in the National APEC Engineer Register and the International APEC Engineer Register*:*

1.1. Applicant shall be a graduate of HEI who completed an accredited engineering program in accordance with the legislation of the Economy.

1.2. Applicant shall demonstrate professional and transferable competences agreed upon with the requirements of the International Engineering Alliance (IEA) stated in *IEA Graduate Attributes and Professional Competences* and included into the correspondent list approved by the National Monitoring Committee of APEC Engineers. Besides, applicant shall have competences necessary for carrying out practical activity in engineering disciplines that are included into the list and agreed upon with *The APEC Engineer Manual* and approved by the National Monitoring Committee of APEC Engineers.

1.3. Applicant shall have a right to carry out individual engineering activity in accordance with the legislation of the Economy and carry out practical activity in a certain engineering discipline.

1.4. Applicant shall have not less than 7 years of practice dealing with complex engineering problem solving after his/her graduation.

1.5. Applicant shall have not less than 2 years of experience working as an executive engineer-manager (planning, designing, coordinating) carrying out significant engineering project (long-term, costly, highly technical, of especial importance).

1.6. Applicant shall continuously develop him/herself and enhance professional skills so that to carry out individual practical engineering activity under the conditions of technological development (he/she shall be trained along with the correspondent programs not less than 50 hours a year, attend training and development courses, serve an internship learning about new technologies).

1.7. Applicant shall carry out activity in the framework of corresponding national legislation and adhere to the Code of APEC Engineer Professional Ethics.

2. Requirements to especial competences necessary for carrying out practical activity in certain engineering disciplines that are included into the list and agreed upon with *The APEC Engineer Manual* are set by the Examination Commissions of the APEC Engineer Certification Center.

Appendix 4

National APEC Engineer Monitoring Committee

Assessment Statement

**REGULATION**

on assessment of compliance of practical engineering activity

indicators with the APEC Engineer Standard

1. Regulation on assessment of compliance of practical engineering activity indicators with the APEC Engineer Standard (further to be referred to as Regulation) defines evaluation of practical engineering activity indicators for those applicants who seek certification and registration in the National APEC Engineer Register and the International APEC Engineer Register followed by awarding of the title of the APEC Engineer.

2. Evaluation of applicants' indicators is carried out on the basis of the application form, corresponding documents and examination results aimed at evaluation of competences that are necessary for carrying out individual practical engineering activity. The evaluation process is carried out in compliance with the following procedure.

2.1. To see whether the requirements in relation to p.1.1 and p.1.3 of the APEC Engineer Standard are met, the APEC Engineer Certification Center evaluates the content of the following documents:

- Higher Education certificate and its compliance with the recognized discipline of engineering practice indicated in the application form,
- State Accreditation certificate of HEI from which the applicant has graduated,
- National Accreditation Agency certificate for engineering program which the applicant has completed.

2.2. The APEC Engineer Certification Center provides exams to evaluate transferable, professional and special competences of applicants necessary for carrying out individual practical engineering activity in various disciplines. This procedure is performed to see whether the requirements in relation to p.1.2 of the APEC Engineer Standard are met.

2.3. The content of notarized copy of work record book and/or other corresponding documents that prove 7-year experience of practical activity connected with engineering problems solving is assessed to see whether the requirements in relation to p.1.4 of the APEC Engineer Standard are met.

2.4. To see whether the requirements in relation to p.1.5 of the APEC Engineer Standard are met the content of notarized copies of documents is assessed. These documents shall prove:

- minimal 2 years of experience in responsible charge of significant engineering and managerial work of an applicant (agreements, acts, etc.),
- significance of an engineering project (considering terms, cost, complexity, importance, etc.).

2.5. To see whether the requirements in relation to p.1.6 of the APEC Engineer Standard are met notarized copies of documents proving that an applicant attended professional development training courses and maintained his/her professional skills in certain discipline of engineering activity during the last two years are assessed.

2.6. To see whether the requirements in relation to p.1.7 of the APEC Engineer Standard are met the following items are checked:

- applicant's agreement to act in accordance with the Code of APEC Engineer Professional Ethics stated in his/her application form, as well as his/her awareness of the Code of APEC Engineer Professional Ethics proved by the results of examination (at the first registration),
- absence of information about violation of the Code of APEC Engineer Professional Ethics by the APEC Engineer for the period of time since the previous registration (at the second registration).

Appendix 5

National Monitoring Committee of APEC Engineers

Assessment Statement

**REGULATION**

on examination of competences necessary for carrying out individual practical activity in engineering disciplines within the

framework of the APEC Engineer Standard

## 1. GENERAL PROVISIONS

1.1. The examination for evaluation of transferable and professional competences of applicants seeking registration as an APEC Engineer, that are described in the APEC Engineer Standard, and evaluation of special competences necessary for carrying out individual practical engineering activity in various disciplines approved by the National Monitoring Committee of APEC Engineers is considered to be indispensable, important and final stage of evaluation procedure of applicants' engineering practice indicators and their compliance with the APEC Engineer Standard.

1.2. The examination consists of two stages:

1.2.1. The first stage is the form of written examination. Written examination is held for evaluation of transferable and professional competences and their compliance with the requirements agreed upon with the requirements of the International Engineering Alliance (IEA) stated in *IEA Graduate Attributes and Professional Competences* and approved by the National Monitoring Committee of APEC Engineers.

Applicants who have successfully passed the written examination in the first stage shall advance to take the oral examination in the second stage. Applicants who graduated from HEI and completed an engineering program accredited by National Accreditation Agency do not have to take the written examination.

1.2.2. The second stage is the form of oral examination and interview aimed to evaluate special competences necessary for carrying out individual practical activity in a certain engineering discipline.

## 2. WRITTEN EXAMINATION

2.1. When evaluating transferable and professional competences of the applicants, their expertise, fundamental knowledge and its application in engineering practice are checked. The form of written examination is the same for all engineering disciplines which is approved by the Chief Executive of the APEC Engineer Certification Center.

2.2. Written examination is held to evaluate applicants' suitability for the APEC Engineer title and ability to solve complex problems that arise in the course of practical engineering activity taking into account a number of technical, economic, ecological and other requirements, standards, laws and the Code of APEC Engineer Professional Ethics.

## 3. ORAL EXAMINATION AND INTERVIEW

3.1. The Examination Commission is established to hold the oral examination. The Examination Commission consists of the chair, two members and leading experts in certain engineering discipline. The oral examination program is developed by the Examination Commission and depends on the engineering discipline.

3.2. The objective of the oral examination is to evaluate the level of applicants' special competences in a certain engineering discipline. During the oral examination special competences are evaluated in accordance with the following criteria:

- manager's responsibility for engineering project works and design in a certain discipline,
- experience in engineering activity in a certain discipline in compliance with the Code of APEC Engineer Professional Ethics,
- practical experience in solving both typical and non-typical complex engineering problems in a certain discipline, managerial and soft skills and knowledge of the law,
- applicant's professional development, benefits to the society of complex engineering activity in a certain discipline.

3.3. Oral examination is followed by the interview. The chair of the Examination Commission explains the interview's objective to the applicant. The applicant is offered to describe one or more engineering projects which he/she took part in. This task helps to define whether the applicant is ready for independent and accountable practical engineering activity in a certain discipline. The Examination Commission members ask the applicant various follow-up questions and offer a number of hypothetic situations. Finally, understanding of all the components of complex engineering activity is evaluated.

3.4. After the interview, the chair and the Examination Commission members make thorough analysis and conclude whether the applicant has exhibited a deep knowledge and experience to be awarded the title of the APEC Engineer. The applicant will be notified of his/her oral examination results when the conclusion is drawn up by the Examination Commission.

Appendix 6
National Monitoring Committee of APEC Engineers
Assessment Statement

**LIST**

of transferable, professional and special competences necessary for carrying out individual practical engineering activity in accordance with

APEC Engineer Standard

1. The following transferable and professional competences are provided by the APEC Engineer Standard, agreed upon with the requirements of International Engineering Alliance (IEA) and described in *IEA Graduate Attributes and Professional Competences:*

1.1. Comprehensive approach to universal knowledge application (an individual shall have deep and comprehensive knowledge, as well as he/she shall be ready to use it as a base for practical engineering activity).
1.2. Comprehensive approach to local knowledge application (an individual shall have the same knowledge and shall be ready to use it in his/her practical engineering activity in the conditions of international professional mobility).
1.3. Engineering problems analysis (an individual shall be ready to describe, examine and analyze complex engineering problems).
1.5. Engineering activity evaluation (an individual shall understand the importance of complex engineering activity, evaluate the outcomes and impacts of complex activities).

1.6. Social responsibility (an individual shall be ready to demonstrate his/her responsibility for social, cultural and ecological consequences of complex engineering activity taking into account sustainable development).
1.7. Legal and regulatory (an individual shall meet all legal and regulatory requirements and protect public health and safety in the course of his/her activities).

1.8. Engineering ethics (an individual shall be ready to carry out engineering activity complying with the Code of APEC Engineer Professional Ethics).
1.9. Engineering activity management (an individual shall be ready to manage one or several types of complex engineering activity either partially or in full).

1.10. Communication (an individual shall be ready to communicate with another participants involved in complex engineering activity).

1.11. Life-long learning (an individual shall be ready for continuing professional development, i.e. to maintain and develop competences).
1.12. Judgment (an individual shall recognize complexity and assess alternatives in light of competing requirements and incomplete knowledge, exercise sound judgment in the course of his/her complex activities).

1.13. Responsibility for engineering decisions (an individual shall be partly or fully responsible for decisions that he/she makes when carrying out complex engineering activity).

2. Requirements to especial competences necessary for carrying out practical engineering activity in certain discipline that are included into the list and agreed upon with *The APEC Engineer Manual* are set by the Examination Commissions of the APEC Engineer Certification Center.

Appendix 7

National Monitoring Committee of APEC Engineers

Assessment Statement


Asia-Pacific
Economic Cooperation

**National Monitoring Committee of APEC Engineers**

This is to certify that

*Mr. John Smith*

has been registered as an

**APEC Engineer**

in the discipline of

«Discipline»

by the National Monitoring Committee of APEC Engineers on

«Date Admitted»

«Signature 1»

«Appointment 1»

«Signature 2»

«Appointment 2»

Registration No: *«Registration No»*

Expiry Date: «Date of Expiry»

Appendix 8

National Monitoring Committee of APEC Engineers

Assessment Statement

**APPLICTION FOR REGISTRATION**

within the National APEC Engineer Register

1. Personal Data:
   - Surname/Family Name, First and Middle Names;
   - Photo;
   - Numbers and Dates of APEC Engineer Registration.
2. Education Background:
   - Educational Institution;
   - Educational Program;
   - Degree Awarded.
3. Engineering Discipline
4. Engineering Work Experience:
   - Position;
   - Company;
   - Period of Working in this Position.
5. Experience of Taking Part in Significant Engineering Projects/Programs, Including Fulfillment of Coordination Functions:
   - Project/Program Implementation Period;
   - Project/Program Brief Description;
   - Role in Project.
6. Professional Development:
   - Confirming Documents;
   - Professional Development Courses Period.

Appendix 9

National Monitoring Committee of APEC Engineer

Assessment Statement

**REGULATION**

on suspension and termination of engineer's registration in the National APEC Engineer Register and the International APEC Engineer Register

1. Engineer's registration in the National APEC Engineer Register and the International APEC Engineer Register shall be suspended in the following cases:

1.1. Delays in annual registration fee payment.

1.2. Violation of the APEC Engineer Professional Code of Ethics.

1.3. Intentional or non-intentional faulty actions of the APEC Engineer have resulted in material, moral or any other damage to an organization or an individual.

Registration suspension period relates to the time of registration fee delay or extent of the damage.

2. Engineer's registration in the National APEC Engineer Register and the International APEC Engineer Register shall be terminated for the following reasons:

2.1. Non-payment of annual registration fee.

2.2. Unlawful registration (violation of the Regulation on Certification and Registration of Individuals Involved in Practical Engineering Activity in the National APEC Engineer Register and the International APEC Engineer Register, as well as other regulations and procedures).

2.3. Glaring intentional or non-intentional faults of the APEC Engineer have resulted in substantial and irrecoverable material, moral or any other damage to an organization or an individual.

2.4. During the period of registration suspension as a result of intentional or non-intentional faulty actions of the APEC Engineer, repeated material, moral or any other damage has been done to an organization or an individual.

2.5. National interests have been damaged as a result of intentional or non-intentional faulty actions of the APEC Engineer.

2.6. Unlawful usage of the APEC Engineer certificate during the period of registration suspension.

2.7. Gross and repeated violation of the APEC Engineer Code of Ethics.

Appendix 10

National Monitoring Committee of APEC Engineers
Assessment Statement

**REGULATION**
on continuing professional development and competences enhancement
of the APEC Engineer

## 1. GENERAL PROVISIONS

1.1. APEC Engineers shall perform services only in the disciplines of their competence.
1.2. In accordance with the APEC Engineer Standard, an engineer shall strive for continuing professional development and competences enhancement, contribute significantly to the development of science and engineering, as well as seek to achieve substantial results in the relevant field.

## 2. PROFESSIONAL COMPETENCE ENHANCEMENT

2.1. There exist various opportunities for formal and informal professional competence enhancement for the APEC Engineer.
By formal kinds of professional development one implies:

- experience exchange as part of internship programs,
- participation in conferences, seminars and training programs,
- short-term professional development courses, etc.
- The following can be regarded as informal kinds of professional competence enhancement:
- reading discipline-related technical literature,
- using modern software,
- keeping track of the recent engineering trends, etc.

2.2. The APEC Engineer shall be able to identify the need for new engineering solutions and technologies, take initiative and strive for innovations.
2.3. The APEC Engineer shall seek to pass on his/her practical experience to colleagues, including subordinates, as well as facilitate their continuing professional development.
2.4. The APEC Engineer shall take regular training, taking account of the distance learning technologies, be involved in self-education, attend conferences, seminars and courses, and publish articles.
2.5. Continuing professional competence enhancement of the APEC Engineer shall focus on:

- contribution to the development of engineering theory and practice,
- development and/or implementation of new engineering ideas,
- development and/or implementation of new engineering solutions,
- development and/or implementation of new standards in engineering practice,
- exchange of scientific and technical knowledge and experience,
- search for opportunities to integrate fundamental and applied engineering knowledge.

2.6. In the fulfillment of his/her professional duties, the APEC Engineer shall hold paramount the welfare of the state and the public.

Appendix 11

National Monitoring Committee of APEC Engineers

Assessment Statement

**CODE**

of APEC Engineer Professional Ethics

## 1. GENERAL PROVISIONS

1.1. The Code of APEC Engineer Professional Ethics in Russia (hereinafter referred to as the Code of Ethics) defines major moral principles of creative work and relations among engineers and other specialists with respect to ethic values, history and traditions of National engineers.

1.2. The highest standards of morality shall lay the foundation for developing a highly professional National APEC Engineer, become the core of his/her active citizenship, facilitate the genuine value of engineering activity, as well as raise the prestige of the National engineering education.

1.3. The key principles of professional conduct and ethics proceed from the fact that free, creative work for ensuring welfare of the public, as well as striving for innovation shall be regarded as matter of honor and dignity of National engineers and the key motive of their professional activity.

1.4. Having the core moral principles in view and respecting the achievements of the previous generations, the National APEC Engineer seeks to enhance the existing engineering solutions and searches for the principally new ones. Discoveries, inventions, rationalization activity and design of principally new technologies and equipment, as well as implementation of innovations with respect to the moral constituent shall provide the basis for practical work of the National APEC Engineer.

## 2. BASIC PRINCIPLES OF PROFESSIONAL ETHICS

2.1. National APEC Engineers shall:

- act for each employer or client in a polite, fair and faithful manner, as well as maintain confidentiality and avoid conflicts,
- provide moral incentives to colleagues and handle any fair criticism in a positive way,

- have an unbiased attitude to all clients and colleagues irrespective of their ethnic belonging, religious views, age, mental and physical abilities, marital status and nationality.
- publish the outcomes of their work, as well as let their subordinates and colleagues do so.

2.2. National APEC Engineers shall not:

- display their experience in order to undermine public trust in the engineer's profession or shatter its reputation,
- issue public statements concerning an engineering project until full factual information on the latter is obtained,
- attempt to injure, maliciously or falsely, directly or indirectly, the professional reputation, prospects, practice, or employment of other National APEC Engineers,
- use engineering products or processes for commercial publicity,
- accept remuneration for the services rendered without consent of the employer,
- accept commissions, discounts, direct or indirect payments or any other remuneration in connection with the work for which they are responsible,
- use confidential information for obtaining profit,
- take part in the engineering project implementation or solve a technical task which might do harm to the society and /or environment (even if this meets customer and employer requirements and is approved by colleagues).

2.3. A professional engineer should:

- continuously search for reliable facts to find and protect the truth, being the main goal of cognition, regardless all the difficulties that might arise,
- respect creative worky of his/her colleagues,
- critically assess his/her own results and achievements and stop any attempts of appropriating other people's achievements,
- use a prospective approach when considering any problem or situation with the account to all the social, environmental and other consequences for the society,
- be able to point out civil and ethical aspects of a problem in the process of searching for new engineering knowledge and solutions, which might at first seem to be purely technical,
- be prepared for a constructive dialogue with representatives of related industries,
- try to minimize the negative consequences of specialised equipment usage for individuals, society and environment,
- deny conservatism and stagnation in creative activity,
- enhance the reputation of the National APEC Engineer.

## 3. KEY MORAL VALUES

3.1. By key moral values of the National APEC Engineer one implies:

- teamwork and partnership in engineering activity, development of professional and general communication, providing reasonable freedom for exchanging scientific and technical information and experience, search for and support of young talented engineers and facilitation to their workplace adjustment, interest in advanced technological achievements,

- development of mutually beneficial cooperation with international partners, studying and implementation of the international experience, discoveries and technologies,
- humanism being one of the attributes of professional activity which manifests itself in creating conditions ensuring creativity, tools and machinery efficiency, labor safety and growth of mechanization level, workability of new appliances and processes, as well as increase in the number of automated workplaces necessary for high performance,
- efficiency of research and technological activity, reduction of costs, usage of target-based approaches when solving scientific and technical tasks which will facilitate production costs decrease, cost-effective use of resources and increase in labor productivity,
- integrity which excludes negligence when spotting incompliance with the established rules, new facts and new conditions, endeavor to officially and legally change out-of-date standards and norms,
- persistence in implementing new engineering solutions, searching for the truth and solving complicated problems,
- aspirations for continuous professional development, knowledge enrichment, acquisition of professional skills and competences, computer literacy being a prerequisite for mastering advanced methods of cognition, designing, development of economically and scientifically grounded technical solutions, labor organization and management, and enhancing general communication culture and amenity,
- outreach activity, fight against ignorance, incompetence, technophobia, raising engineering culture of employees,
- organized and disciplined way of thinking and behavior,
- responsibility for assumed obligations, ideas implementation and consequences of engineering activity, open acknowledgement of his/her errors.

Appendix 12

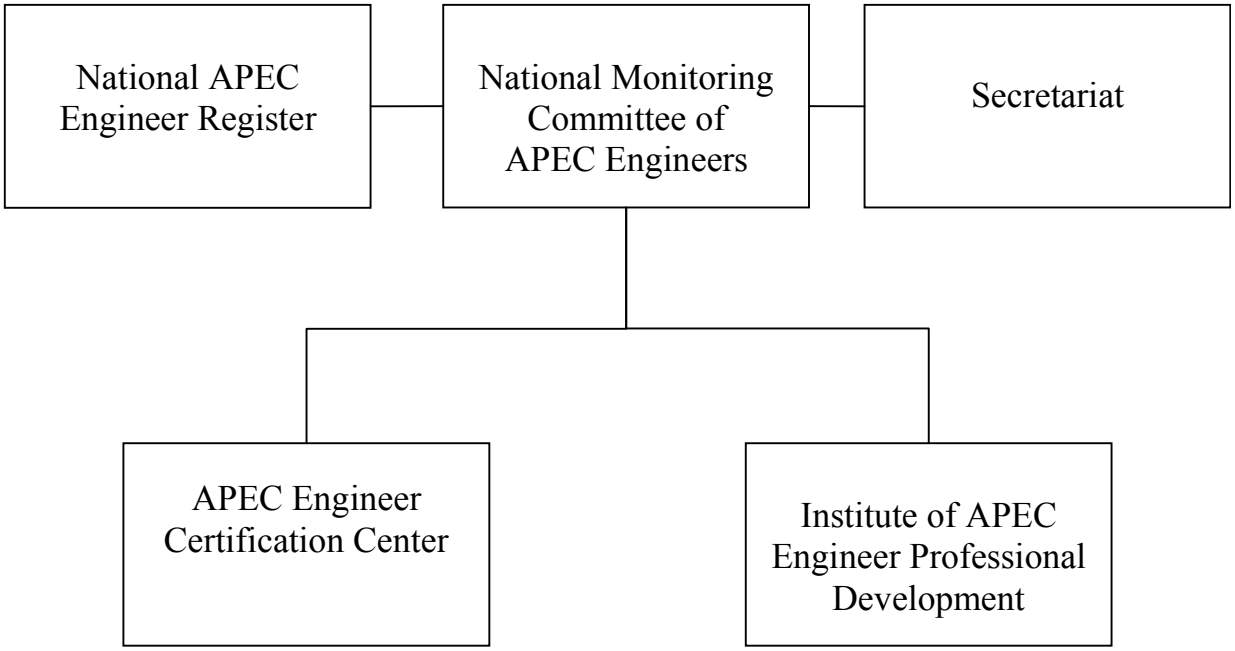
National Monitoring Committee of APEC Engineers

Assessment Statement

**ORGANISATION CHART**

The system of certification and registration

in the National APEC Engineer Register



Appendix 13
National Monitoring Committee of APEC Engineers
Assessment Statement

# APPLICATION FORM

for registration within the National APEC Engineer Register

and the International APEC Engineer Register

Application form No _____

for registration within the National APEC Engineer Register

and the International APEC Engineer Register

**1.** Personal data

| Surname/Family Name | Sex<br>M/F | Date of Birth | Photo |
|---|---|---|---|
| First Name | Passport Details | | |
| Middle Name | | | |

**2.** Contact Information

| Address: | Tel (including city code): |
|---|---|
| | Mobile: |
| | Fax (including city code): |
| | E-mail: |

**3.** Previous Registration in the Register

If you have previously applied for registration in one of the recognized engineering disciplines or have been registered in the National APEC Engineer Register, note the recognized discipline of engineering practice, registration number and the date in the table below.

| Registration Type | Recognized Engineering Discipline | Registration/Application Form Number | Date |
|---|---|---|---|
| Previous Registration | | | |
| Previous Application Form | | | |

**4.** Educational Information

| University/Academy/ Institute | Education Period | Educational Program | Degree Awarded | Education Certificate (including serial number) |
|---|---|---|---|---|
| | | | | |
| | | | | |

**5.** Recognized disciplines of engineering practice
Select disciplines of engineering practice for the National APEC Engineer Register.

| | | | |
|---|---|---|---|
| | Aerospace Engineering | | Geotechnical Engineering |
| | Bioengineering | | Computer Engineering |
| | Chemical Engineering | | Mechanical Engineering |
| | Civil Engineering | | Mining Engineering |
| | Environmental Engineering | | Petroleum Engineering |
| | Electrical Engineering | | Transportation Engineering |

**6.** Career Summary
Describe your involvement in your selected discipline(s) of engineering and summarize the positions you have held in the following table.

| No | Period of Experience | Name of Organization | Position/Title | Summary of Engineering Practice | Verified by (Initials, Contact Phone, Signature) |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

**7.** Summary of Significant Engineering Work
Provide a brief summary of each project for which you were personally accountable and state your position, the number of months you were in charge of the work.

| No | Period of Experience | Name of Organization | Position/Title | Months | Nature of project, its significance, your functions, responsibilities, achievements, practical innovations, original applications of theory | Verified by (Initials, Contact Phone, Signature) |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| Total number of months: | | | | | | |

**8.** Continuing professional development

Provide a record of Continuing Professional Development activities for the last two years.

| No | Period of Training | Name of Course/ Program | Training Supplier Organization | Number of Hours | Confirming Documents |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

**9.** Penalty
Have any penalty been imposed on you for the last two years? If yes, state the reason.

**10.** Confirming documents
Tick the documents enclosed to the application form.

| | |
|---|---|
| ☐ | Notarized copy of education certificate |
| ☐ | Notarized copy of work record book |
| ☐ | Notarized copies of professional development certificates for the last two years |
| ☐ | Registration fee payment slip (state the fee paid in rubles). |

By signing this document I confirm that all the information provided herein is true.
I agree to follow the Code of APEC Engineer Professional Ethics.

Signature_____ (_____) Date

For official use only

| | | YES | NO |
|---|---|---|---|
| 1. | Information on academic degree of the applicant meets the requirements. | ☐ | ☐ |
| 2. | The applicant has submitted the higher education certificate | ☐ | ☐ |
| 3. | Engineering experience of the applicant meets the requirements | ☐ | ☐ |
| 4. | Documents confirmming sufficent engineerring expeirience of the applicant are submitted. | ☐ | ☐ |
| 5. | Significant engineering experience of the applicant meets the requirements | ☐ | ☐ |
| 6. | Evidence of significant engineering experience of the applicant is provided. | ☐ | ☐ |
| 7. | CPD records of the applicant meet the requirements. | ☐ | ☐ |
| 8. | CPD confirming documents of the applicant are submitted. | ☐ | ☐ |
| 9. | Has the applicant been subject to any penalty? | ☐ | ☐ |
| 10. | The documents of the applicant fully meet the requirements for initiating the APEC Engineer registration procedure | ☐ | ☐ |

11. Additional notes/comments_____

_____

Appendix 14

National Monitoring Committee of APEC Engineers

Assessment Statement

**REGULATION**

on the APEC Engineer Certification Center

1. The APEC Engineer Certification Center is established within the system of certification and registration of engineers in the National APEC Engineer Register and the International APEC Engineer Register. The main objective of the center is to certify applicants' practical activity indicators in compliance with the requirements described in the APEC Engineer Standard applying the procedures that are agreed upon with *The APEC Engineer Manual* and approved by the National Monitoring Committee of APEC Engineers. That also includes arrangement and setting of examinations that help to evaluate transferable, professional and special competences necessary for carrying out practical engineering activity in certain disciplines.

2. The APEC Engineer Certification Center establishes the Examination Commissions and sets examinations that help to evaluate transferable and professional competences of applicants seeking registration as an APEC Engineer. It also states their compliance with the requirements set by the APEC Engineer Standard. Furthermore, it evaluates special competences necessary for carrying out independent and accountable practical engineering activity in a certain discipline approved by the National Monitoring Committee of APEC Engineers on the basis of examination results.

3. The APEC Engineer Certification Center makes decision about the compliance of applicants' practical activity indicators with the criteria stated in the APEC Engineer Standard, applying the procedures that are agreed upon with *The APEC Engineer Manual* and approved by the National APEC Engineer Monitoring Committee.

4. Decisions of the APEC Engineer Certification Center about entering personal data and practical activity indicators of an engineer who has confirmed the compliance with the requirements of the APEC Engineer Standard into the National APEC Engineers Register and the International APEC Engineer Register are approved by the National Monitoring Committee of APEC Engineer.

5. Organisation chart, responsibilities and budget of the APEC Engineer Certification Center are approved by the National Monitoring Committee of APEC Engineers. The APEC Engineer Certification Center is headed by the Chief Executive appointed by the National Monitoring Committee of APEC Engineers.

Appendix 15

National Monitoring Committee of APEC Engineers

Assessment Statement

**REGULATION**

on the Institute of APEC Engineers Professional Development

1. The Institute of APEC Engineers Professional Development shall be established within the system of certification and registration of engineers in the National APEC Engineer Register and the International APEC Engineer Register. The main objectives of the Institute of APEC Engineers Professional Development are to formulate requirements to continuing professional development and enhancement of transferable, professional and special competences of practicing engineers in conformity with the *APEC Engineer Manual,* and to develop and implement relevant CPD programs.

2. The Institute of APEC Engineers Professional Development shall be either an Institute within National technical university or a separate CPD Institution, which shall be in charge of providing CPD programs and certified by the National Monitoring Committee of APEC Engineer.

3. Among the tasks of the Institute of APEC Engineers Professional Development are:

- learning and analyzing contemporary international requirements (*APEC, EMF*) to transferable, professional and special competences of engineers engaged in independent practical activity in various disciplines,
- promoting international cooperation and experience exchange between CPD institutes in *APEC Engineer Register* signatory countries,
- developing recommendations on enhancing requirements to transferable, professional and special competences of APEC Engineers in Russia with respect to the global trends of engineering development and to the methods of competences assessment,
- developing and implementing CPD programs and enhancement of transferable, professional and special competences of APEC Engineers in Russia in conformity with the international requirements,
- establishing a network of CDP institutes providing engineers training based on the approved programs.

4. The director of the Institute of APEC Engineers Professional Development shall submit an annual report to the National Monitoring Committee of APEC Engineers.

## Conclusions

The International Seminar «Development of Engineering Professionals in APEC Economies» was held successfully with total number of participants equal to about 50.

According to the discussion «Development of National System of Qualifications and Competences in Russian Federation» proposed by the Agency for Strategic Initiatives, the latest initiatives have been considered.

At the end of the Seminar the following conclusions were elaborated. The APEC Engineer system should be promoted; in the immediate future, it may not be obviously beneficial or attractive to individuals, but for the development of Economies in the region as a whole, the mobility of professionals is a must.

Therefore, it is beneficial to encourage more economies in the APEC region to participate. The APEC Economies Leaders should be convinced to take proactive action to facilitate the mobility of engineering professionals and to include the APEC Engineer System in the bilateral and multilateral trade agreements. To this end the set of regulatory documents was designed specifying the work of the national systems for certification and registration of professional engineers in APEC Engineer Register

Key results of the Seminar were discussed in the International Engineering Alliance Session on June 2012 (Sidney, Australia) and will be delivered during the APEC Summit on Russkiy Island in September 2012.