
PART 1 APEC ENGINEER FRAMEWORK

1. Purpose

The APEC Engineer Manual provides overall guidance to participating APEC economies for the operation of APEC Engineer Registers. The Manual includes a description of the Framework as a whole, the particular requirements of the assessment system, the APEC Engineer Coordinating Committee Rules, and recommendations for mutual exemption for regulatory and licensing authorities.

Monitoring Committees of each participating economy develop an Assessment Statement that includes criteria and procedures for approval by the APEC Engineer Coordinating Committee. In accordance with the Framework, the eligibility of practitioners for designation as an APEC Engineer is determined by reference to five performance criteria, *which are to be considered as a package*. Some of these criteria are relatively objective in nature, while others will require the Monitoring Committee to exercise a measure of professional judgment, particularly in relation to exceptional candidates.

The participants to this Framework intend to facilitate practice by professional engineers by establishing a system of mutual recognition based on confidence in the integrity of the systems of assessment for professional practice within each economy, secured through continuing mutual monitoring, evaluation and verification of those systems.

This Framework therefore provides a mechanism through which the participating economies can work together to identify certain professional engineers, considered by participants to be substantially equivalent in their competence to practise within any participating economy, as APEC Engineers.

2. APEC Engineers

An APEC Engineer is defined as a person who is recognised as a professional engineer within an APEC economy, and who has satisfied an authorised body in that economy, operating in accordance with the criteria and procedures approved by the APEC Engineer Coordinating Committee, that they have:

- completed an accredited or recognised engineering program, or assessed recognised equivalent; and
- been assessed within their own economy as eligible for independent practice; and
- gained a minimum of seven years practical experience since graduation; and
- spent at least two years in responsible charge of significant engineering work; and
- maintained their continuing professional development at a satisfactory level.

In addition all practitioners seeking registration as APEC Engineers must also agree to be:

- bound by the codes of professional conduct established and enforced by their home jurisdiction and by any other jurisdiction within which they practice; and be

- held individually accountable for their actions, both through requirements imposed by the licensing or registering body in the jurisdictions in which they work and through legal processes.

Each practitioner included on the APEC Engineer Register shall be identified with one or more recognised engineering disciplines, selected from a list approved by the Coordinating Committee, within which that practitioner has been assessed as being eligible for independent practice by the Monitoring Committee holding the Register. Appendix III refers.

Guidelines on the above criteria for APEC Engineers are at Appendix I to this Framework. The participants consider that other guidelines in this Manual should be observed in assessing candidates for designation as APEC Engineers. These guidelines have been attached as Appendix II to this Framework.

3. Monitoring Committees

This Framework is based on the concept that a Monitoring Committee will be established in each participating economy, to develop and maintain a Register of APEC Engineers in that economy. In most cases, while recognised as competent by, and possibly exercising some functions on behalf of, the authorities responsible for the registration and licensing of professional engineers in the economy concerned, the Monitoring Committee will be an independent authorised body, and will be able to certify the qualifications and experience of individual professional engineers directly or by reference to other competent bodies.

The specific responsibilities of Monitoring Committees for the development and maintenance of the APEC Engineer Register are given below at Section 5, Register of APEC Engineers, and the broader Terms of Reference are at Appendix IV to this Framework.

4. APEC Engineer Coordinating Committee

To ensure consistency in application of the agreed criteria, ultimate authority for conferring the title of APEC Engineer will remain with the APEC Engineer Coordinating Committee, which is to include one voting representative from each Monitoring Committee. That authority may be delegated from time to time by the APEC Engineer Coordinating Committee to an authorised Monitoring Committee in each participating economy.

The main role of the Coordinating Committee is to facilitate the maintenance and development of authoritative and reliable decentralised Registers of APEC Engineers, and to promote the acceptance of APEC Engineers in each participating economy as possessing general technical and professional competence that is substantially equivalent to that of professional engineers registered or licensed in that economy.

The Committee will also:

- develop, monitor, maintain and promote mutually acceptable standards and criteria for facilitating practice by APEC Engineers throughout the participating APEC economies;
- seek to gain a greater understanding of existing barriers to such practice and to develop and promote strategies to help governments and licensing authorities reduce those barriers and manage their processes in an effective and non-discriminatory manner;

- through the mechanisms available within APEC, encourage the relevant governments and licensing authorities to adopt and implement streamlined procedures for granting rights to practise to APEC Engineers;
- identify, and encourage the implementation of, best practice for the preparation and assessment of engineers intending to practise at the professional level; and
- continue mutual monitoring and information exchange by whatever means are considered most appropriate, including:
 - regular communication and sharing of information concerning assessment procedures, criteria, systems, manuals, publications and lists of recognised practitioners;
 - invitations to verify the operation of the procedures of other participants; and
 - invitations to observe open meetings of any boards and/or commissions responsible for implementing key aspects of these procedures and relevant open meetings of the governing bodies of the participants.
 - reporting on the use by engineers to monitor the performance of the Registers.

To maximise communication between APEC economies, the APEC Engineer Coordinating Committee will issue an open invitation for the appropriate bodies within non-participating APEC economies to nominate non-voting members to serve on the Committee.

These members will not be entitled to vote on any issue, nor to participate in the debate on the initial or continued authorisation of a Monitoring Committee to operate a Register of APEC Engineers within an economy.

The APEC Engineer Coordinating Committee Rules are at Part 3 of *The APEC Engineer Manual*.

5. Registers of APEC Engineers

The primary objective of each Monitoring Committee will be to develop and maintain a Register of APEC Engineers for practitioners based in the relevant economy.

Each Monitoring Committee seeking authorisation to operate a Register in their economy will prepare a statement setting out the criteria and procedures by which applicants for designation as APEC Engineers within that economy are proposed to be assessed. Each statement will be reviewed by the APEC Engineer Coordinating Committee in accordance with its published Rules and the guidelines attached as Appendix 1 to this Framework.

Following that review, authorisation will require support from two-thirds of the Monitoring Committees authorised to operate Registers. The statement of criteria and procedures supplied by each authorised Monitoring Committee will form an integral part of this Framework.

Once a Monitoring Committee has been authorised by the APEC Engineer Coordinating Committee to establish a Register of APEC Engineers within an economy, the Monitoring Committee will arrange to provide timely and accurate information on the status of any practitioner claiming to be listed on that Register to any person or organisation having a legitimate need for access to such

information, to exchange relevant data with the other authorised Monitoring Committees, and, within their economy, to function as a single point of contact on all matters relating to APEC Engineers.

Each authorised Monitoring Committee must further undertake to:

- accept and promote the substantial equivalence of the competence of APEC Engineers registered by other authorised Monitoring Committees;
- make every reasonable effort to ensure that the bodies responsible for registering or licensing professional engineers to practise within their economy recognise that APEC Engineers have general technical and professional competence substantially equivalent to that of engineers already registered or licensed in that economy;
- ensure that all practitioners registered by them as APEC Engineers comply fully with the requirements specified in the APEC Engineer Framework, and that a substantial majority of these practitioners have demonstrated their compliance through the primary procedures and criteria set out in the Assessment Statement for that economy;
- ensure that practitioners applying for registration as an APEC Engineer are required to provide evidence that they have engaged in an appropriate level of recent continuing professional development; and
- ensure that practitioners registered by them as APEC Engineers apply from time to time for renewal of their registration, and, in so doing, provide evidence that they have engaged in an appropriate level of recent continuing professional development.

6. Mutual Exemption

The participants recognise that any agreement, which would confer exemption, in whole or in part, upon APEC Engineers from further assessment by the statutory bodies that control the right to practise in each economy, could be concluded only with the involvement and consent of those statutory bodies and the relevant governments. The APEC Engineer Coordinating Committee recommends that (i) relevant governments pursue this within the broader APEC framework and that (ii) negotiation of agreements be consistent with the General Agreement on Trade in Services (GATS) Article VII.

The participants note that only complete or partial exemption from assessment mechanisms operating within the jurisdiction in which an APEC Engineer seeks to become licensed or registered is at issue, not exemption from the requirement to become licensed or registered in the economy concerned.

The participants note that licensing or registering authorities have statutory responsibility for protecting the health, safety and welfare of the community within their jurisdictions, and may require applicants for the right to independent practice to submit themselves to some form of supplemental assessment.

The participants consider that the objectives of such assessment should be restricted to providing the relevant authorities with a sufficient degree of confidence that the practitioners concerned:

- understand the general principles behind applicable codes of practice;
- have demonstrated a capacity to apply such principles safely and efficiently; and
- are familiar with other special requirements operating within the host jurisdiction.

The participants consider that, in the case of APEC Engineers, successful completion of an adaptation period of sponsored practice in the jurisdiction where they seek to become licensed or registered might be more effective than requiring them to undertake other kinds of supplemental assessment, and that APEC Engineers should be granted access to opportunities for such sponsored practice with minimum formality.

Mutual Exemption Framework Guidelines for Regulatory Authorities are at Part 4 of *The APEC Engineer Manual*

7. Establishment Provisions

Representatives of an APEC economy seeking to participate in the APEC Engineer will recommend to the appropriate authorities within that economy that a representative be nominated to participate as a non-voting member on the APEC Engineer Coordinating Committee.

Each Monitoring Committee established or identified through this process will proceed to prepare a draft Assessment Statement in accordance with this Manual, and will provide a copy of the draft Statement to the Secretariat established by the APEC Engineer Coordinating Committee and to all Monitoring Committees.

The Assessment Statement will be considered by the APEC Engineer Coordinating Committee as soon as practicable after the draft Assessment Statement has been received by the Secretariat and the relevant Monitoring Committees have had the opportunity to respond to any comments raised by other Monitoring Committees and submit amended Statements.

The draft Assessment Statement provided by each Monitoring Committee will then be reviewed in accordance with the approved Rules and may, in order to ensure consistency and mutual confidence, be:

- approved as submitted; or
- with the consent of the proponent, approved with amendments; or
- referred back for further consideration, with suggestions for improvement.

Where approval has been granted, the Monitoring Committee involved will be provisionally authorised to develop and maintain a Register of APEC Engineers within their economy in accordance with their statement of criteria and procedures.

Their continued authorisation will be subject to periodic review in accordance with the approved Rules.

8. Rules

Appropriate Rules are established by the APEC Engineer Coordinating Committee to ensure that the work of the Committee can be undertaken in a satisfactory and expeditious manner. The adoption of, or amendment to, such Rules will proceed only through a positive vote by at least two-thirds of the Monitoring Committees in a General Meeting.

The APEC Engineer Coordinating Committee Rules are at Part 3 of *The APEC Engineer Manual*.

9. Administration

General Meetings of the APEC Engineer Coordinating Committee will be held at least once in each two year period to review the Rules, effect such amendments as may be considered necessary, consider the outcomes of any reviews undertaken of the criteria and procedures being implemented by authorised Monitoring Committees, and deal with applications for membership and/or authorisation. The administration of the APEC Engineer Coordinating Committee will be facilitated by a secretariat established and operated in accordance with the Rules.

10. Termination

The APEC Engineer Coordinating Committee will operate for so long as it is acceptable and desirable to participating economies. Any authorised Monitoring Committee wishing to surrender its authorisation and cease operation of an APEC Engineer Register within their economy must give at least twelve months notice to the secretariat. No such cessation of operation will, of itself, affect standing granted prior to that cessation by other economies to APEC Engineers on the basis of their listing on the terminated Register.

APPENDIX 1: APEC Engineers: Guidelines on Criteria and Procedures

The purpose of these guidelines is to assist Monitoring Committees to develop a statement of criteria and procedures for submission to the APEC Engineer Coordinating Committee. In accordance with this Framework, the eligibility of practitioners for designation as an APEC Engineer is determined by reference to five performance criteria, which are to be considered as a package. Some of these criteria are relatively objective in nature, while others will require the Monitoring Committee to exercise a measure of professional judgment, particularly in relation to exceptional candidates. These notes represent the consensus view of the participants as to the benchmarks against which each criterion should be considered.

Completed an accredited or recognised engineering program, or assessed recognised equivalent

In order to be listed on an APEC Engineer Register, practitioners must demonstrate to the relevant Monitoring Committee a level of academic achievement at, or following, completion of formal education substantially equivalent to that associated with successful completion of:

- an engineering degree delivered and accredited in accordance with the best practice guidelines developed by the Federation of Engineering Institutions of South East Asia and the Pacific; or
- an engineering degree accredited by an organisation holding full membership of, and operating in accordance with the terms of, the Washington Accord; or
- the 1st Step Examination of the Professional Engineer Examination set by the Japan Consulting Engineers Association; or
- the combined Fundamentals of Engineering and Principles and Practices of Engineering examinations set by the United States National Council of Examiners in Engineering and Surveying; or
- an engineering program accredited by a body independent of the education provider, or an examination set by an authorised body within an economy, provided that the accreditation criteria and procedures, or the examination standards, as appropriate, have been submitted by one or more Monitoring Committees to, and endorsed by, the APEC Engineer Coordinating Committee.

These examples include four existing mechanisms, the outcomes of which are considered to fall within the band of acceptable standards for academic achievement. The final option is designed to be an open-ended mechanism, allowing alternative procedures and criteria to be submitted by a Monitoring Committee for evaluation by the Coordinating Committee. The list is therefore not intended to be definitive or comprehensive.

This approach does not restrict participation to economies in which engineering programs are accredited, or examinations set, by an independent professional body, and does not imply that acceptable academic achievement can be demonstrated only within the context of an engineering degree program.

Been assessed within their own jurisdiction as eligible for independent practice

The assessment may be undertaken by the Monitoring Committee, by a competent professional association, or by an authority with responsibility for registration or licensing of professional engineers within the relevant economy.

Gained a minimum of seven years practical experience since graduation

The exact definition of practical experience will be at the discretion of the Monitoring Committee concerned, but the work in question should be clearly relevant to the fields of engineering in which the applicant claims expertise. During the initial period, the candidate should have participated in a range of roles and activities appropriate to these fields of engineering. However, their roles while they are in responsible charge of significant engineering work may be more focused.

Spent at least two years in responsible charge of significant engineering work

The definition of significant engineering work will vary between economies and disciplines. As a general guideline, the work should have required the exercise of independent engineering judgment, the projects or programs concerned should have been substantial in duration, cost, or complexity, and the applicant should have been personally accountable for their success or failure. In general, an applicant may be taken to have been in responsible charge of significant engineering work when they have:

- planned, designed, coordinated and executed a small project; or
- undertaken part of a larger project based on an understanding of the whole project; or
- undertaken novel, complex and/or multi-disciplinary work.

The specified period of two years may have been completed in the course of the seven years practical experience since graduation.

Maintained their continuing professional development at a satisfactory level

The nature and extent of the required participation in continuing professional development, and the manner in which compliance is audited, will remain at the discretion of the Monitoring Committee concerned, but should reflect emerging norms for such participation by professional engineers within the APEC economies.

Registered APEC Engineers must agree to the following.

- ***Codes of professional conduct.*** All practitioners seeking registration as APEC Engineers must also agree to be bound by the codes of professional conduct established and enforced by their home jurisdiction and by any other jurisdiction within which they are practising. Such codes normally include requirements that practitioners place the health, safety and welfare of the community above their responsibilities to clients and colleagues, practice only within their area of competence, and advise their clients when additional professional assistance becomes necessary in order to implement a program or project. Monitoring Committees are required to certify that at registration the candidate has signed a statement of compliance with such applicable professional codes.
- ***Accountability.*** APEC Engineers must also agree be held individually accountable for their actions, both through requirements imposed by the licensing or registering body in the jurisdictions in which they work and through legal processes.

Appendix II: APEC Engineer Assessment Statements

The APEC HRD Working Group *Discussion Paper, Framework for Best Practices in Professional Engineering Accreditation, Recognition and Development*, December 1997, defines in broad terms, the qualifications and experience required of a practitioner seeking registration as an APEC Engineer. The APEC HRD Working Group *Best Practices in Professional Engineering Accreditation, Recognition and Development Survey Report*, May 1997, outlines the practices currently used by eight member economies for the identification of professional engineers.

The preparation of an Assessment Statement for candidates seeking registration as an APEC Engineer will involve identification and nomination of the following elements by the Monitoring Committee in each participating economy:

1. One or more mechanisms for accrediting or recognising:
 - structured educational programs which qualify individuals to enter professional engineering practice, and/or
 - assessment instruments which provide an alternative or supplementary mechanism for individuals to demonstrate that they have reached an appropriate educational standard.
2. One or more mechanisms for assessing qualified individuals as being eligible for independent professional engineering practice, normally after those individuals have completed a period of supervised or monitored professional experience.
3. A mechanism for confirming that independent engineering practitioners have:
 - gained a minimum of seven years practical experience since graduation, and
 - completed at least two years in responsible charge of significant engineering work, and
 - maintained a satisfactory level of continuing professional development, and
 - complied with, and are bound by, an appropriate code of conduct.
4. A mechanism for ensuring that registrants are audited at regular intervals to ensure that they have continued to comply with the conditions of registration.

For each element, the Assessment Statement for each member economy may include:

- mechanisms applicable to practitioners in all disciplines, and/or
- mechanisms applicable to practitioners in specified disciplines, and/or
- national, regional and provincial mechanisms, and/or
- existing or superseded mechanisms.

which are recognised by the Monitoring Committee as appropriate in assessing candidates for registration as APEC Engineers. The Monitoring Committee may attach restrictions to any or all mechanisms (for example, by requiring that assessment under a mechanism be accepted only in respect of candidates who completed the process by a specified date, or who gained a specified minimum period of practical experience in the relevant discipline or disciplines). All such restrictions must be clearly identified.

Assessment Statements are intended to be dynamic documents, with necessary amendments being effected by the responsible Monitoring Committee from time to time and notified to the APEC Engineer Coordinating Committee.

Appendix III: APEC Engineers: Disciplines for Registration

Principles

For each practitioner included on the register of APEC Engineers, the Monitoring Committee shall identify one or more recognised engineering disciplines, selected from a list approved by the Coordinating Committee, within which that practitioner has been assessed as being eligible for independent practice. At the time of publication the Coordinating Committee has approved the following disciplines:

- CIVIL
- STRUCTURAL
- GEOTECHNICAL
- ENVIRONMENTAL
- MECHANICAL
- ELECTRICAL
- INDUSTRIAL
- MINING
- CHEMICAL

The nine specified engineering disciplines are those operating in participating economies at the time of publishing this Manual. The disciplines include subjects and areas of practice that cover a broad field. Economies have agreed to define the scope of each of these disciplines.

APEC Engineers will be expected to satisfy technical issues specific to the host jurisdiction. Economies have agreed to specify these technical issues, by discipline during the process of negotiation of mutual exemption agreements.

Not all economies license or register professional engineers by discipline for local practice. However, all economies have confirmed that they are prepared to identify the discipline in the context of which such engineers were originally assessed. Economies that wish to propose further disciplines be added to the above list should do so when they submit assessment statements for consideration by the Coordinating Committee.

The Coordinating Committee will continue to review the desirability of extending the above list of disciplines to meet emerging needs of governments, industry and the engineering professions within APEC member economies, and may, by unanimous resolution, add new disciplines to the list from time to time.

Professional Practice

Registration indicates maintained competence in one or more aspects of professional practice. The definition of an APEC Engineer recognises that the responsibilities which engineers take often evolve during their career, reflecting an increasing emphasis on management roles, and causing practitioners to engage in continuing professional development activities relevant to those roles. In general terms, an APEC Engineer classified in any discipline may, having due regard to their current competence:

- accept direct or indirect responsibility for the planning, design, execution or review of some specialised technical aspects of engineering projects or programs; and/or

- accept ultimate responsibility, which may extend beyond a single discipline, for the technical integrity of engineering projects or programs; and/or
- engage in professional practice which, directly or indirectly, calls upon their engineering knowledge, skills, experience and judgment, and has a significant influence on the technical direction of engineering projects or programs; and/or
- engage in other professional activities, including, in particular, project management, which call on their engineering qualifications and experience, and which place demands upon their skills, knowledge and judgment which are comparable to those experienced in the above aspects of engineering practice.

Procedures

The Monitoring Committee established in each participating economy will prepare, and submit to the Coordinating Committee for review, an Assessment Statement covering at least one of the above engineering disciplines.

The subsequent responsibility of a Monitoring Committee will be to establish and maintain a Register of APEC Engineers which certifies the competence of practitioners in each discipline for which an Assessment Statement has been submitted to and approved by the Coordinating Committee, and to accept and promote the substantial equivalence in competence of all APEC Engineers registered in that discipline.

Members of the Coordinating Committee will abstain from voting on the initial or continuing acceptance of those elements of an assessment statement which relate only to a discipline that is not covered by the Monitoring Committee which they represent.

A Monitoring Committee may at any time submit a further Assessment Statement in respect of a recognised discipline in which that committee does not currently certify the competence of APEC Engineers.

Appendix IV: APEC Engineer Monitoring Committees

Terms of Reference

Each Monitoring Committee:

- develops and maintains a Register of APEC Engineers in its own economy;
- functions as a single point of contact on all matters relating to APEC Engineers;
- accepts and promotes the substantial equivalence in competence of all APEC Engineers;
- advises bodies responsible for registering or licensing professional engineers accordingly;
- provides timely and accurate information on whether individuals are APEC Engineers;
- develops and maintains an assessment system to ensure that APEC Engineers have:
 - completed an accredited or recognised engineering program or assessed recognised equivalent;
 - been assessed within the economy as eligible for independent practice; and
 - gained a minimum of seven years practical experience since graduation; and
 - spent at least two years in responsible charge of significant engineering work; and
 - maintained their continuing professional development at a satisfactory level;
- where appropriate, authorises other bodies to carry out assessments against these criteria;
- ensures that a mechanism is available for individuals to appeal against adverse judgments;
- audits compliance by such authorised bodies with the conditions of authorisation;
- directly, or through authorised bodies:
 - audits continuing compliance by APEC Engineers with the conditions of registration; and
 - receives, investigates and resolves complaints against APEC Engineers; and
 - provides advice on professional conduct and professional practice;
- maintains and disseminates a list of persons whose APEC Engineer registration has been cancelled;
- submits statements to enable the Coordinating Committee to review the proposed system;
- publishes information on its assessment procedures, criteria, systems and performance;
- provides such other information as may be required by the Coordinating Committee;
- maintains records and documents in a form suitable for review by other economies;
- provides representatives to assist in reviewing other assessment systems; and
- participates in the other deliberations of the Coordinating Committee.

Membership

The structure and constitution of a Monitoring Committee will naturally reflect the particular circumstances of the economy within which it is established. In general terms, the committee should include representatives from government, industry, relevant professional associations, and higher education institutions delivering engineering programs, and should be recognised as competent by the authorities responsible for registration and licensing within the economy.

In some cases, an existing board or committee may already be undertaking many of the tasks implied in the above terms of reference, and can be nominated by the economy to undertake the role of the Monitoring Committee for that economy.

While decisions on the structure and constitution of the Monitoring Committee are ultimately reserved for the economy concerned, the committee will form an important part of the overall assessment system for that economy, and the statement on that system which will be provided to the

Coordinating Committee must explain how the Monitoring Committee intends to gain access to the resources and expertise required to discharge the above Terms of Reference.