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**An Overview of the Development of Technical  
Infrastructure in the Asia-Pacific Region:  
The Work of the Asia-Pacific Economic Cooperation (APEC)  
Sub-Committee on Standards and Conformance (SCSC)  
and the Specialist Regional Bodies (SRBs)**

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## **Abstract**

The development and maintenance of an economy's standards and conformance technical infrastructure is critical to its economic health. By increasing the competence of its measurement and testing capabilities, in particular, an economy can provide substantial benefits to its manufacturers and consumers. It is also better equipped to participate in the confidence building requirements of the region to take advantage of increased trade opportunities.

Technical infrastructure development is a major focus of the Asia-Pacific Economic Cooperation (APEC) Sub-Committee on Standards and Conformance (SCSC) and the Specialist Regional Bodies (SRBs) which work together closely to develop practical programs to assist this development.

**Key Words:** accreditation; Asia-Pacific; conformity assessment; documentary standards; mutual recognition; physical standards; technical infrastructure









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## **Introduction**

Dating from the formation of the Asia-Pacific Economic Cooperation (APEC) Sub-Committee on Standards and Conformance (SCSC) in 1994, the development of basic technical infrastructure within all APEC member economies has been clearly identified to be essential for trade and investment facilitation. Two studies have examined existing technical infrastructure in the region and have determined basic requirements for effective participation in the global market by all APEC member economies.<sup>1</sup>

This paper examines the work that has been carried out by the SCSC since its creation in 1994, with an emphasis on the Sub-Committee's initiatives and cooperation with Specialist Regional Bodies (SRBs) in the area of technical infrastructure development. After providing a broad overview of the SCSC, specific referral will be made to:

- both physical and documentary standards, and
- conformity assessment, including testing and calibration laboratories, quality systems, and product certification.

These topics will also include a discussion of relevant SCSC initiatives and SRB activities in those areas. The paper concludes with an examination of the future relationship between the APEC SCSC and the SRBs (See Annex 1 for a list of SRB members.)

## **Overview of the APEC SCSC**

The APEC Sub-Committee on Standards and Conformance (SCSC) was established at the Meeting of the Committee on Trade and Investment (CTI) in Jakarta, Indonesia in November, 1994. At that meeting, APEC members adopted the "Declaration on an APEC Standards and Conformance Framework". This declaration provided APEC members with a set of common objectives and enabled the development of many of the current programs of the SCSC. In November 1995, this Declaration was translated into the Osaka Action Agenda, in which APEC member economies agreed to common objectives for standards and conformance in four major areas. These objectives include:

- Ensuring transparency of standards and conformity assessment of APEC economies;
- Aligning APEC member economies' mandatory and voluntary standards with international standards;
- Achieving mutual recognition among APEC economies of conformity assessment in regulated and voluntary sectors; and
- Promoting cooperation for technical infrastructure development to facilitate broad participation in mutual recognition arrangements in both regulated and voluntary sectors.<sup>2</sup>

APEC SCSC members recognize that to best develop the technical infrastructure underpinning standards and conformity assessment regimes in the Asia-Pacific region, it is vital to ensure that communication and collaboration take place at both the individual and collective levels. For that reason, the APEC SCSC has undertaken work programs in each of the above areas. The work programs involve an exchange of information among member economies and with Specialist Regional Bodies, and cooperation on various activities to reach the target goal of free trade in the



APEC region by 2010 for developed economies and by 2020 for developing economies. To further support cooperation toward this target goal, the Terms of Reference of the Sub-Committee state that the "SCSC's work will be designed to complement, rather than substitute, that already taking place in Specialist Regional Bodies." In addition, the SCSC will collaborate with the SRBs where appropriate and coordinate its work program with that of the SRBs.<sup>3</sup> The SCSC thus envisions that greater collaboration with the SRBs and the work programs already mentioned will effectively support the further expansion of trade and development of technical infrastructure in the Asia-Pacific region.

## **Physical and Documentary Standards**

### **1. National Standards for Physical Measurement**

Each APEC member economy has its own physical standards and maintains a national measurement system under the administration or coordination of a national government agency or agencies. Most economies have a national standards laboratory which is responsible for maintaining primary or secondary physical standards. Traceability of measurement is maintained through a network of accredited calibration laboratories. In some economies (e.g., Australia, Canada, New Zealand, Japan), national measurement arrangements are covered by national legislation.

Most APEC members are also members of the major international organizations in this field, including the International Bureau of Weights and Measures (BIPM), the Convention du Metre under which the BIPM was established and is maintained, and the International Organization for Legal Metrology (OIML).

At the regional level, APEC member economies have long recognized that commonality in testing instruments will promote equity in commerce throughout the region and greater safety in constructed products and materials. This requires an effective legal metrology system with an underlying metrological infrastructure of demonstrable integrity and competent personnel. The two specialist regional bodies which are developing this infrastructure are the Asia-Pacific Legal Metrology Forum (APLMF) and the Asia Pacific Metrology Program (APMP).

The APLMF seeks to promote the development of effective systems and increased trade throughout the region by harmonizing legal metrology regulations under the International Organization of Legal Metrology (OIML) and by organizing the infrastructure of legal metrology in its member economies. This includes determining common means for testing instruments used in legal metrology, including medical instrumentation and equipment used in measuring mass of traded commodities. Twenty APEC member economies currently participate in the APLMF (See Annex 1.)

Fourteen APEC members participate in the APMP. (See Annex 1.) The objective of APMP is to promote the regional and international recognition of the measurement capability of its members. APMP is currently undertaking intercomparison studies, the results of which will be compiled with other regions' studies. It is also assisting with development of a global MRA by BIPM in



metrology.

A number of member economies also have bilateral agreements between their national standards laboratories and are developing relationships with others through intercomparisons, staff exchanges and research activities. However, acceptance or recognition of equivalence of national measurement standards and traceability arrangements remains an area for further development throughout APEC and the Asia-Pacific region.

## **2. Documentary Standards**

While APEC member economies generally have similar aims in international standardization, they have adopted a wide variety of domestic standard-setting systems and procedures. Systems range from a decentralized framework with more than one organization involved in the standardization process to a more formal structure where government agencies administer standardization activities. Still other economies rely on a central coordinating statutory body under which several standards-writing organizations are accredited.

Most APEC economies have a national standards body, in some cases a publicly owned body and in others a private sector body. Where privately owned, the standards body may have a charter or other formal document from the national government granting it standards-writing authority. Within such a framework, member economies may allow other organizations to have a standards-setting role in defined areas.

According to the Terms of Reference of the Sub-Committee on Standards and Conformance, the common policy adopted throughout APEC member economies is to participate in the development of international standards and to adopt and align with international standards wherever possible. In addition, member economies ensure that standards and technical regulations are not prepared, adopted or applied with a view to, or with the effect of, creating unnecessary obstacles to international trade.

### **2.a. Alignment of standards within APEC**

The SCSC action agenda calls on member economies to cooperate on international standards activities. The current work program within the SCSC specifically relates to the alignment of national standards with international standards. Actions of the SCSC under this work program include:

- Adoption of a document entitled, "APEC Guide for the Alignment of Member Economies' Standards with International Standards". This document helps create a common understanding of alignment of voluntary standards;
- Revision and consolidation of International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC) Guide 3 (Identification of National Standards that are Equivalent to International Standards) and ISO/IEC Guide 21 (Adoption of International Standards in National Standards). Revised Guide 21 provides for increased transparency and a common basis for determining the extent of alignment of national standards with international standards;





- Identification of priority groups of standards for alignment by 2000 for developed economies and by 2005 for developing economies, including standards for electrical and electronic appliances, rubber products, food labeling, and plastic products. Additional priority areas include all electrical safety (IEC 60335 series) and relevant EMC (CISPR) standards for electrical and electronic equipment, targeted for alignment by 2004 for developed economies and 2008 for developing economies;
- Adoption of "APEC Guidelines for the Preparation, Adoption and Review of Technical Regulations";
- Future development of a Guide to Good Regulatory Practice to help facilitate trade in APEC member economies;
- Increased participation by APEC members in relevant international standards activities. Currently, work is ongoing to coordinate regional positions for input into the ISO in the area of building and construction standards; and
- Consideration of perceived deficiencies or inappropriateness of certain international standards to determine any deficiencies when raised by an APEC member economy.<sup>4</sup>

## **2.b. Cooperation with Specialist Regional Bodies**

At the regional level, the APEC SCSC and the Pacific Area Standards Congress (PASC) are cooperating to address areas of mutual interest in the ISO/IEC. In the area of building and construction standards, the PASC has developed a cooperative mechanism to encourage greater regional participation in building and construction-related activities of international standards bodies and to ensure that the participation is coordinated at the regional level. By forming even more strategic alliances within this community, the region as a whole will see greater support for its efforts at the international level.

## **Conformity Assessment**

Conformity assessment is defined in ISO/IEC Guide 2: 1996 as: "any activity concerned with determining directly or indirectly that relevant requirements are fulfilled." Conformity assessment procedures provide a means of ensuring that the products, services, or systems produced or operated have the required characteristics, and that these characteristics are consistent from product to product, service to service, or system to system. Conformity assessment includes: sampling and testing; inspection; certification; and quality and environmental system assessment and registration. It also includes accreditation of the competence of those activities by a third party and recognition (usually by a government agency) of an accreditation program's capability.<sup>5</sup>

### **1. Network of Calibration Laboratories**

On the conformity assessment side, most APEC member economies either have or are developing networks of calibration laboratories with traceability to physical measurement standards. In some cases, this traceability is provided not to national physical measurement standards, but to internationally recognized national physical standards of another member economy.



Where a member economy has its own network of calibration laboratories, they are accredited by a governmental body or a body that is recognized by the national government. In most cases, this accreditation is carried out in accordance with relevant international guidelines. In other cases, economies carry out their accreditation in accordance with national accreditation guidelines that are comparable to international guidelines. However, there is still a need to strengthen these accreditation systems and to ensure that they conform with relevant ISO/IEC guidelines.

## **2. Network of Accredited Testing Laboratories**

Most APEC member economies have both privately and publicly owned laboratories. Accreditation of these laboratories is often a function of government or requires national government endorsement. In some economies (e.g., New Zealand, Hong Kong, China, Chinese Taipei) there is effective government ownership of the laboratory accreditation system. In others (e.g., Australia) a private accreditation organization operates with national government support, while still others (e.g., United States) have both private sector and governmental laboratory accreditation bodies.

Some APEC members have entered into mutual recognition arrangements on laboratory accreditation with other APEC economies. Many also have bilateral mutual recognition arrangements with laboratory accreditation systems outside APEC. In addition, individual laboratories engage in mutual recognition agreements with overseas counterparts.

The Asia-Pacific Laboratory Accreditation Cooperation (APLAC) serves as a regional body in this area and includes seventeen APEC members (See Annex 1.) The objectives of APLAC are to foster the development of competent laboratories and inspection bodies in member economies and to harmonize accreditation practices in the region, thereby facilitating the recognition of laboratories and inspection bodies and the acceptance of test data and inspection reports across national borders. APLAC members have developed a Multilateral Mutual Recognition Arrangement (MRA) which will facilitate more formally recognition of one another's accredited laboratories. This will help ensure that a product tested by a laboratory accredited by a member body need not be retested in another member economy (See Annex 2.)

## **3. Certification of Quality Systems**

More than half of the APEC member economies report that quality system certification organizations operate in their economies. In these economies, certification of quality management systems is carried out by both private and public organizations. ISO 9000 is the most common standard against which firms are certified, but there are others. In some economies, quality management system certifications are becoming part of regulatory requirements for products, but generally they remain optional. Some economies report some form of cross-border affiliations, mostly between certification bodies. International acceptance in this area continues to develop as new bilateral agreements are executed.

Greater regional cooperation in this area has been developed through the Pacific Accreditation



Cooperation (PAC), in which twelve APEC members participate. (See Annex 1.) PAC's mission is to encourage the worldwide acceptance of members' quality system certifications. Currently, PAC is establishing and implementing a multilateral mutual recognition agreement (MLA) among accreditation body members. To ensure that PAC MLA members will be accepted into the worldwide International Accreditation Forum (IAF) MLA, assessments are conducted in accordance with procedures developed by the IAF. In addition, PAC and IAF are considering developing an MLA for product certification. The PAC MLA has been signed by accreditation bodies in seven economies, all of which are APEC member economies. (See Annex 2.)

#### **4. Product Certification**

Within most APEC member economies, product certification programs are linked to governments through regulation, government ownership of the certification organization, or government recognition of the certification organization. Certifications may be to national or international standards, with most certifiers operating in accordance with relevant ISO/IEC Guides. The use of international standards in technical regulations and the acceptance of certificates issued in other economies varies across APEC. Accreditors of certifiers are working with their international counterparts to establish the commonality of accreditation processes with the ultimate aim of achieving mutual recognition agreements. In some cases, accredited certification organizations have affiliations of various types with certification bodies in other countries.

#### **5. APEC Mutual Recognition Work Program**

The work program of the APEC SCSC encourages mutual recognition among APEC economies of conformity assessment in regulated and voluntary sectors. Some of these regulatory level mutual recognition activities within the framework of APEC include:

- Mutual Recognition Arrangement for Conformity Assessment of Telecommunications Equipment;
- Mutual Recognition Arrangement Mechanism for the Exchange of Information on Toy Safety;
- Mutual Recognition Arrangement for Conformity Assessment of Electrical and Electronic Equipment Safety;
- Arrangement for the Exchange of Information on Food Recall and Food Recall Guidelines; and
- Mutual Recognition Arrangement for Foods and Food Products.

Of these, the Telecommunications MRA is the most developed, with 20 APEC economies having indicated their intent to participate. The Arrangement for the Exchange of Information on Toy Safety has been limited to exchange of information on the identification of hazards.

#### **6. Cooperation with Specialist Regional Bodies in Mutual Recognition of Conformity Assessment**

Progress has also been made to create and implement mutual recognition agreements at the voluntary level. As previously mentioned, one such effort involves the Asia-Pacific Laboratory Accreditation Cooperation (APLAC). APLAC has developed a Mutual Recognition



Arrangement in which a group of eleven laboratory accreditation bodies in eight Asia-Pacific economies recognize the competence of each other's accreditation in both testing and calibration. This is a good practical solution to gaining regional acceptance of test data. It reduces the costs associated with current requirements to test products in both the exporting and importing market. Recognizing that there is a need to continue the development of regional acceptance of these systems, more accreditation bodies will sign the agreement once they have been found to be competent. Other Specialist Regional Bodies undertaking mutual recognition activities include the Pacific Accreditation Cooperation (PAC), which promotes the mutual acceptance of quality system certification at the level of accreditation bodies, and the Asia-Pacific Metrology Program (APMP), which is helping BIPM to develop a global MRA in metrology (See Annex 2).

### **Technical Infrastructure Projects within the APEC SCSC**

Having evaluated the needs of the region in terms of its technical infrastructure, the SCSC has conducted and implemented several technical infrastructure projects. These projects are developed in accordance with SRB work programs, with an emphasis on non-duplication of work effort throughout the region. Among these projects are:

- International Quality Assurance Systems (IQAS) project - Through a series of workshops, a core training manual for Small and Medium Sized Enterprises (SME) Executives has been developed, with additional workshops planned;
- Project on an integrated regional approach to enhance food control systems - This project will commence in 1999 with workshops planned on the topics of Food/Drug Interface and Application of Principles of Risk Analysis;
- MRA readiness project (proposed) - Given the mandate by APEC leaders to achieve a free and open trading system by 2010 for developed member economies and by 2020 for developing member economies, this project would evaluate the levels of achievement of each APEC member economy with regard to certain criteria that have been shown to be of importance in developing mutual recognition agreements (e.g., operation of accreditation programs in accordance with international standards, traceability); and
- Inter-comparisons, proficiency testing and traceability (proposed) - This project would identify and compile an inventory of intercomparisons needed and would be carried out in close collaboration with the Asia-Pacific Metrology Program (APMP).

### **Future Cooperation between APEC SCSC and the Specialist Regional Bodies**

Recognizing that the Specialist Regional Bodies provide a critical underpinning of technical infrastructure within the region, the SCSC is discussing the possibility of strengthening the relationship between the APEC SCSC and the SRBs. Some suggestions for the future relationship include:

- Funding by APEC for any work items which APEC SCSC requests of the SRBs (and inclusion of all SRB members in any APEC-requested activity even if the membership does not mirror that of APEC);
- Development of a "Statement of Commitment" between the SRBs and the SCSC;
- Facilitation of and funding for meetings of SRB Secretariats by APEC;





- Provision of priority funding assistance by APEC to developing economy representatives to attend APEC-SRB events from both within and outside APEC; and
- Requesting SRBs to comment on all relevant work items within APEC SCSC.

### **Conclusion**

A growing number of economies in the Asia-Pacific, whether or not members of APEC, have participated in technical infrastructure development activities in recent years. Some have participated in SRB activities, some in APEC activities or other multilateral activities, and still others participate in activities at the bilateral level.

Given the influence of the level of development of an economy's technical infrastructure on its participation in the global marketplace, it is critical that the APEC SCSC continues the momentum of developing regional technical infrastructure in close cooperation with the Specialist Regional Bodies by such actions as:

- Encouraging APEC members to ensure that the relevant bodies from their economies become members of SRBs;
- Ensuring that regular contact is maintained between APEC SCSC representatives and SRB representatives; and
- Developing a workplan between the SCSC and each of the SRBs.

It will also be important to undertake a periodic assessment of how far Asia-Pacific economies have come and what still needs to be accomplished in the area of technical infrastructure development to help achieve the goal of APEC - free and open trade among all member countries by the year 2020.



## Participation of APEC Economies in Specialist Regional Bodies <sup>6</sup>

Annex I

| APEC Member Economies      | APLAC | APMP | APLMF | PAC | PASC |
|----------------------------|-------|------|-------|-----|------|
| Australia                  | X     | X    | X     | X   | X    |
| Brunei Darussalam          | X     |      | X     |     | X    |
| Canada                     | X     |      | X     | X   | X    |
| Chile                      |       |      | X     |     | X    |
| People's Republic of China | X     | X    | X     | X   | X    |
| Hong Kong, China           | X     | X    | X     |     | X    |
| Indonesia                  | X     | X    | X     | X   | X    |
| Japan                      | X     | X    | X     | X   | X    |
| Republic of Korea          | X     | X    | X     | X   | X    |
| Malaysia                   | X     | X    | X     | X   | X    |
| Mexico                     |       |      | X     |     | X    |
| New Zealand                | X     | X    | X     | X   | X    |
| Papua New Guinea           | X     | X    | X     |     | X    |
| Peru                       |       |      |       |     |      |



| APEC Member Economies | APLAC | APMP | APLMF | PAC | PASC |
|-----------------------|-------|------|-------|-----|------|
| Philippines           | X     | X    | X     | X   | X    |
| Russia                |       |      | X     |     | X    |
| Singapore             | X     | X    | X     | X   | X    |
| Chinese Taipei        | X     | X    | X     | X   |      |
| Thailand              | X     | X    | X     | X   | X    |
| U.S.A.                | X     |      | X     |     | X    |
| Vietnam               | X     | X    | X     |     | X    |

APLAC full members also include: India and Nepal

APMP full members also include: Bangladesh, Fiji, India, Kiribati, Maldives, Nepal, Pakistan, and Sri Lanka

APLMF full members also include: Mongolia

PASC full members also include: Colombia, Fiji, and South Africa



## Participation of APEC Economies in Mutual Recognition Activities of Specialist Regional Bodies\*

Annex 2

| APEC Member Economies      | APLAC | PAC |
|----------------------------|-------|-----|
| Australia                  | X     | X   |
| Brunei Darussalam          |       |     |
| Canada                     |       | X   |
| Chile                      |       |     |
| People's Republic of China |       | X   |
| Hong Kong, China           | X     |     |
| Indonesia                  |       |     |
| Japan                      | X     | X   |
| Republic of Korea          | X     |     |
| Malaysia                   |       | X   |
| Mexico                     |       |     |
| New Zealand                | X     |     |
| Papua New Guinea           |       |     |
| Peru                       |       |     |
| Philippines                |       |     |





| APEC Member Economies | APLAC | PAC |
|-----------------------|-------|-----|
| Russia                |       |     |
| Singapore             | X     | X   |
| Chinese Taipei        | X     |     |
| Thailand              |       |     |
| U.S.A.                | X     |     |
| Vietnam               |       |     |

\* APMP members take part in mutual recognition activities at the international level  
 APLMF and PASC do not currently have any regional mutual recognition activities



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