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**Asia-Pacific
Economic Cooperation**

APEC SCSC Education Guideline 2

APEC Strategy for Education and Outreach on
Standards, Conformity Assessment, and Technical
Regulations (SCATR)

APEC CTI SCSC
July 2009

KSA KOREAN
STANDARDS
ASSOCIATION



Ministry of Knowledge Economy
Korean Agency for Technology and Standards



**Asia-Pacific
Economic Cooperation**

Education Guideline
On Standards and Conformance
for APEC Member Economies

APEC SCSC
Education
Guideline

2

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APEC CTI SCSC

July 2009

American National Standards Institute (ANSI)

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1 Introduction

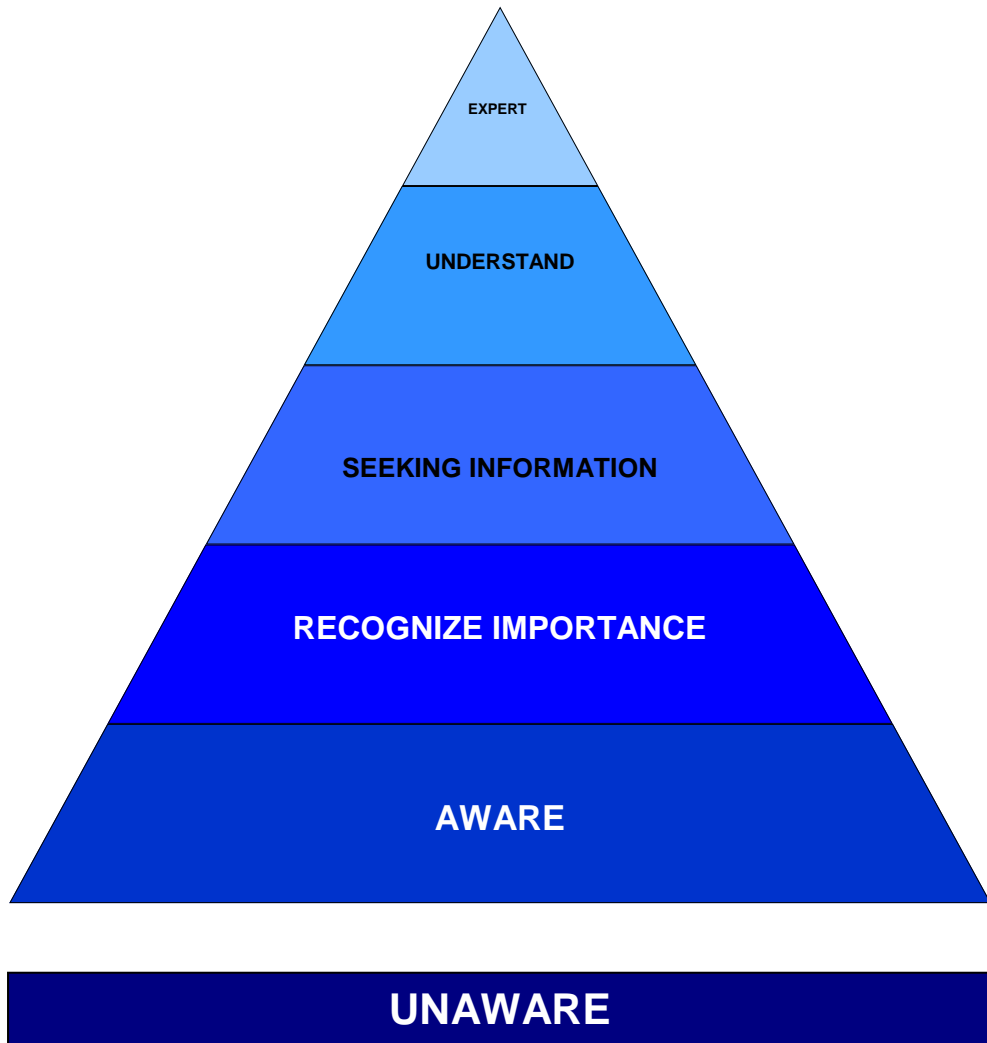
To date, access to knowledge about standards, conformity assessment, and technical regulations (SCATR) among public and private sector leaders has not matched the growing impact that SCATR has had on the global economy. Data suggests that education and training in the Asia Pacific Economic Cooperation (APEC) region have traditionally targeted standards and conformity assessment professionals. In other words, these are professionals already working directly in the standards development process either as representatives of a national or international standards body or as technical experts. Given that many APEC economies reference voluntary standards in technical regulations that depend to a varying extent on government input, training initiatives are sometimes, although to a lesser extent, directed towards government officials as well.

However, the relevance of standards, conformance, and technical regulations reaches far beyond the standards community alone. It has been said that “Standards are like air: you don’t notice them until they’re gone.” Recent media attention on product safety has illustrated this point well by casting the spotlight on how standards and conformance can affect the business community and consumers in addition to trade policy professionals, legislators, and regulators. It is becoming more apparent that steps to educate these groups, as well as the academic community, will require a broader approach to education initiatives on SCATR. The “APEC Strategy for Education and Outreach on Standards, Conformity Assessment, and Technical Regulations” will aim to expand and enhance general awareness of SCATR among professionals from a variety of backgrounds and, more specifically, to conduct education outreach among current public- and private-sector leaders. The initiative will likewise place special emphasis on raising awareness of SCATR among tomorrow’s business and government leaders and professionals by performing outreach to students and the academic community.

Current knowledge and understanding of SCATR can be summarized in the format of a “knowledge pyramid” as depicted in Figure 1. The ultimate goal of the “APEC Strategy for Education and Outreach” will be to place individuals who are currently unaware of SCATR within the knowledge pyramid, and to progressively push others located in the pyramid upward through each of the categories toward the apex.

Ideally, the strategy would eventually result in a large majority of communities reaching the second level of the pyramid, “Understand”.

Recent controversy related to the breakdown of SCATR in product safety has also revealed how little most professionals understand about how standards, conformity assessment, and technical regulations are interrelated. At the same time, they are interdependent on one another and very distinct in their respective functions. In addition to widening the scope of training participants in SCATR education initiatives, a broader approach will also include emphasizing the important link between standards, conformity assessment, and technical regulations. A SCATR education and outreach initiative will strive to increase holistic approaches to teaching the subjects of standards, conformity assessment, and technical regulations to reveal such nuances to training participants.



<Figure 1> Knowledge Pyramid

In order to accurately understand each level of the pyramid, the following definitions are specified:

Level 1 – “Expert”: At the apex of the pyramid, the expert can instruct others on the practices and procedures of international standards development; the definitions of standards, conformity assessment, and technical regulations as is understood throughout the SCATR community; and the full impact that SCATR can have on a wide range of communities.

Level 2 – “Understand”: Individuals that fall in level two know how to effectively participate in relevant SCATR fora; can define “standard”, “conformity assessment”, and “technical regulations” as is understood throughout the SCATR community; and can fully appreciate the impact of SCATR as it relates to their direct professional community and needs.

Level 3 – “Seeking Information”: Individuals that fall in level three have recognized the impact of SCATR as it relates to their direct professional community and needs but do not yet fully understand how to accurately use SCATR terminology and do not yet effectively participate in relevant SCATR fora. They are categorized above the “Recognize Importance” stage because they are now proactively seeking to reach level two, “Understand”.

Level 4 – “Recognize Importance”: Individuals that fall in level three have identified the origins of product and service specifications and recognize the impact of SCATR as it relates to their direct professional community and needs. However, they do not yet accurately use SCATR terminology and have not yet recognized that action can be taken to influence the impact of SCATR (e.g. investment in SCATR-related activities, participation in standards development organizations, etc.)

Level 5 – “Aware”: At the bottom of the pyramid, individuals at level five know that an underlying structure for standards, conformity assessment, and technical regulations requires them to meet certain product or service specifications. However, they do not know how to define these terms correctly and have not yet identified the origins of these product specifications.

Level 6 – “Unaware”: Located outside of the pyramid, these individuals have no exposure to or knowledge of an underlying structure for standards, conformity assessment, and technical regulations requiring products and services to meet certain specifications.

2 Importance of Standards, Conformity Assessment and Technical Regulations (SCATR)

The importance of increasing formal education in SCATR has already been recognized in many APEC economies. In several cases, steps are already in progress to amplify these efforts. As the Korean Standards Association (KSA) has noted, "there is a great need for standards professionals because standards are no longer a matter of choice." In an increasingly harmonized and globalized economy, SCATR has widespread implications for business and trade, the environment, societal well-being, technology transfer, innovation, and quality development. The international community, including APEC, has recognized the impact that SCATR has on cross-border business and trade and is progressively implementing solutions for more international cooperation as the case study below demonstrates.

Case Study: International Electrotechnical Commission Certification Body (IEC/CB) Scheme Program Promotes International Trade

The IEC/CB Scheme was developed to give manufacturers of electrotechnical equipment and components a method for the international transferability of test certificates. Based on mutual recognition, if a manufacturer's national certification body (NCB) adheres to the IEC/CB Scheme and thus accepts Certification Body (CB) test certificates from other NCBs applying the scheme, it will not be required to produce third party certification in the economy to which it is exporting but rather the CB test certificate. Thus, the IEC/CB scheme promotes international cooperation and confidence by employing the principles of peer assessment and industry "self-policing" as the driving forces behind its effectiveness. CB certificates have become the global medium of exchange for the mutual acceptance of electrical equipment test data and certifications.

As environmental issues gain ground in the policies of several major economies, many organizations are witnessing increased pressure to limit the negative impact of their activities on the environment. Economies throughout the APEC region are evaluating regulatory and/or voluntary mechanisms to protect the environment. In an effort to address either increasing consumer or governmental pressure, APEC economies are taking measures to address their environmental performance. International standards such as the ISO 14000 series for environmental management systems as well as product or substance-specific standards such as the ASTM International F40 standards for declarable substances, have addressed a growing industry need amongst these organizations for the evaluation of their environmental management and performance.

Case Study: AHRI Certification Encourages Energy Efficiency

The Air-Conditioning, Heating, and Refrigeration Institute (AHRI, formerly ARI) is a North American trade association recognized worldwide as a primary developer and certifier in the heating, ventilation, air-conditioning, and refrigeration (HVACR) industries. AHRI has established an internationally recognized certification mark, which provides a sound engineering basis for rating the efficiency of HVACR equipment of over 150 million appliances globally.

Manufacturers participate in the industry-developed, driven, and managed AHRI certification schemes purely on a voluntary basis, relying on the scheme's independent testing to prove to consumers that their products perform competitively. Certified ratings for the certification programs are published in AHRI's Directory of Certified Product Performance, making available a resource that demonstrates to consumers how a company's product measures up to others by sharing certified efficiencies and capacity ratings. Comparing product performance ratings allows consumers to effectively judge which product may be appropriate for a particular job. The Directory of Certified Product Performance gives the consumer confidence that the selected product will perform as indicated.¹

The risks of inadequate attention to SCATR give impetus to a drive for promoting increased professional and formal education in these fields. Limited investment in standardization can lead to a loss of competitiveness for businesses and innovation for economies, forcing them to adapt their products to existing standards, *de facto* or *de jure*. Furthermore, a knowledge gap between "standards insiders" – stakeholders that have traditionally pursued standards development – and "standards outsiders" – stakeholders that have not invested in standards development – could create market dominance by the former. Currently, "standards insiders" have access to a great deal of information that is not necessarily available to "standards outsiders", again demonstrating the need for more SCATR education initiatives.

Likewise, inadequate attention to SCATR can have greater trade implications. Several economies throughout the world have explicitly highlighted the critical nature of SCATR to international trade in their standards strategies. This is because of the large quantity of goods and services in international trade that are increasingly affected by standards². With such significant stakes in the international trade landscape, international disputes involving standards are also growing, making standards "the new [international] battleground"³. Therefore, with the existing risk that SCATR mechanisms will be used in a protectionist manner, government officials and business professionals will be required to have the knowledge necessary to effectively monitor global trends in the implementation of SCATR. In other words, they must be able to react knowledgeably when SCATR is used by foreign markets to replace traditional trade barriers with technical barriers.

Inadequate understanding of SCATR often draws away from an appreciation for existing private-sector voluntary mechanisms that may be both more efficient and more technically relevant, in favor of overbuilt, inflexible, and ineffective regulatory solutions. Although the business community may be aware of how SCATR affects its priorities, it is often not sufficiently proactive, either not investing in acquiring information on SCATR or not properly using this information as a guide. Subsequently, companies miss opportunities to drive open markets through international harmonization of standards and acceptance of conformity assessment.

¹ www.ari.org/standardscert

² According to the Opening Statement of the U.S. House of Representatives' Subcommittee on Environment, Technology and Standards made on May 11, 2005 concerning hearings on *China, Europe and the Use of Standards as Trade Barriers*, it is estimated that standards directly affect more than \$7 trillion in international trade.

³ Phillip J. Bond, U.S. Department of Commerce, Undersecretary of Commerce for Technology Policy

When confronted with a crisis situation where standards and conformity assessment mechanisms have not been adequately implemented globally (e.g. product safety issues), pushing to implement additional government regulations can sometime provide such businesses with a more positive public image as a responsible organization taking the necessary steps to rectify the problem. However, if standards are “like air,” responsible organizations should already have access to the knowledge necessary to use voluntary mechanisms to the largest extent possible, relying on technical government regulations only when necessary, thus ensuring seamless transactions.

Unlike the business community, policy-makers often recognize the broad impact that SCATR can have on trade and are much more involved in promoting the visibility of specific instances where SCATR was not sufficiently addressed. However, often driven by the hot topic of the day, focus on improving general practices in the implementation of SCATR is often abandoned to pursue topics that may already be too far gone to truly have an effect. Instead of using this energy to influence issues that will inevitably become important in the future but are not yet recognized as a problem by future stakeholders, policy-makers often try to change practices where they can no longer have any real impact. While the importance of SCATR is well appreciated by the policy community, addressing SCATR-related issues by prioritizing current issues over future issues only deters from the latter.

3 Overview of Current Education Outreach Efforts

What is currently known about standards education efforts already being performed throughout the APEC region relies primarily on thirteen responses to a survey recently issued to APEC’s twenty-one member economies. The survey was developed and distributed by the APEC Sub-Committee on Standards and Conformance (SCSC) and requested that respondents provide information by June 19, 2007 on:

- (1) the priority and place standards education is given in their respective national standards strategies;
- (2) the recipients of standards education initiatives on which priority is placed;
- (3) descriptions of standards education initiatives performed recently including which audiences were targeted for each; and
- (4) the lessons to be learned from these standards education activities.

Several solicited organizations from within the APEC region responded to the survey, providing a broad picture on how standards education has been executed to date. Respondents included the national standards bodies of Australia, Brunei Darussalam, Chile, China, Hong Kong, Indonesia, the Republic of Korea, Malaysia, Singapore, Chinese Taipei, Thailand, the United States, and Vietnam. In addition, several private-sector organizations, companies, and academic institutions provided feedback through their respective economies. A list of institutions that contributed through their economies can be found in Annex A.

Some preliminary assumptions regarding the scope of current standards education activities can be drawn from the variety of responses received. Acknowledging that information on training initiatives performed since 2006 described in the survey may

be incomplete, the following conclusions are strictly based on the information that was submitted to the “APEC Survey to develop a Strategic Education Model for Standards and Conformance” and on the responses provided by contributing member economies⁴. First, standards education initiatives in the majority of respondent APEC economies are limited. With a few exceptions (Republic of Korea, China, and the United States), most responding national standards bodies have performed no more than three training initiatives since January 2006.

Second, the majority of standards training initiatives target professional development rather than engaging formal education venues to teach standardization at a purely academic level. Outreach to raise awareness of SCATR for public policy, legal, media, and other circles was not addressed in this survey. The survey also noted that, when professional education is performed, training tends to target individuals working in a profession directly related to standards or standards development. This included either representatives of national or international standards bodies, technical experts developing standards, or both. Occasionally, this training was extended to government officials who may then use their knowledge to reference standards in technical regulations, or to address SCATR-related trade barriers. The business community, including both executives and lower-level staff, was less often included in professional development training on standards.

Third, standards training initiatives usually approach SCATR from a single perspective, addressing either the topic of standards, conformity assessment, or technical regulations but not all at the same time. A primary focus of the APEC Strategy for Education and Outreach on SCATR is to tie the subjects of standards, conformity assessment, and technical regulations together into more holistic training initiatives. Currently in the APEC region, the most popular form of SCATR training is in standards or the standards development process for professionals working directly in this field. When conformity assessment is covered, this is typically for a target audience of professionals working in the fields of accreditation, certification, or testing.

Finally, while standards training initiatives targeting students and business professionals are either not yet developed or not yet widely available, the responding APEC member economies recognize the importance of seeking out these groups. The need to more thoroughly educate the business and academic communities has been recognized by several respondents to the survey, most often as a means to foster general awareness. In addition, some APEC economies have already taken steps to incorporate standards education initiatives into these two communities.

3.1 Classic Standards Education Targeting Standards Professionals

One of the most common forms of standards education already underway in several APEC member economies and others throughout the world is training targeted at key personnel within the standards community. Typically, this type of education effort introduces employees from foreign national standards bodies to the processes and procedures utilized in the host institution’s economy and, often, to those of well-known international standards developers such as the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC), and

⁴ For a complete list of contributing organizations, see Annex A.

ASTM International. Such training is often in the direct interests of the host institution by introducing training recipients to friendly standards development practices that will ultimately benefit the host institution's economy. Thus, it is clear why such standards training initiatives are well practiced worldwide.

Case Study: UL University

Underwriters Laboratories (UL) has been offering traditional training on its standards development and conformity assessment programs since 1894. Today, UL University, a global education unit of the organization, has been successful in making classic training seminars more widely accessible through a variety of training mediums, including public, open-forum sessions or private, customized sessions via on-site, web-based, teleconference, or video-conference. These programs are designed for a broad range of participants, from students to business executives to standards professionals, in the United States and internationally.

3.2 Formal Standards Education Targeting Students

Formal standards education specifically targeting students is still limited throughout the APEC region. However, some economies have taken the lead on introducing the concepts of standards, conformity assessment, and technical regulations to students. Occasionally, the topic of standards is addressed in primary and secondary school subjects, such as Social Studies or Current Events, to raise students' general awareness of the role that standards play in their daily lives. The main objective of addressing standards in this context is to prepare students for their future role as consumers, not necessarily as professionals, manufacturers, or civil servants. However, developing standards-specific curricula for formal education has increasingly become a priority in both the Republic of Korea and China.

Case Study: Standards Education in the Republic of Korea

In the Republic of Korea, developing curricula for formal education at the primary, secondary, and university levels has been identified as a national priority in its goals to train standards experts, expand the professional networks of current standards experts, and increase awareness about standardization through the promotion of educational activities. To achieve these objectives, the national strategy of the Republic of Korea has specified "establishing a department of standardization in universities in order to build education infrastructure." Programs that have already been developed tend to attract and be oriented towards engineering students. However, these programs are open to several disciplines and focus primarily on the role standardization plays in global trade, domestic and international standards development processes, the standards strategies of several leading markets, resources for finding relevant standards, and the use of standards as a management tool.

In addition to introducing university level standardization programs, the Republic of Korea has been very active in introducing events and curricula dedicated to standards at the primary and secondary levels. One particular event mobilizes primary and early secondary school students throughout the Republic of Korea to compete in teams in a “Standards Olympiad.” One hundred teams of three students each are eventually selected from the large number of participants that submit proposals to an open task publicized on-line. The final competition takes place over the course of three days amongst the one-hundred teams. Final awards are presented by the Korean Ministry of Commerce, Industry, and Energy to six primary school teams and ten secondary school teams. Such events provide young learners with an opportunity to receive national recognition while learning more about the importance of standards within a competitive and entertaining environment.

While formal standards education curricula are still very much the exception, they have been implemented more often at the undergraduate and graduate levels than at the primary and secondary school levels. This is understandable given the fact that students begin to acquire more detailed and career-oriented knowledge at these stages of education.

Case Study: University-Level Standards Education in China

In recent years, China has taken many steps to incorporate the subject of standards into the curricula of undergraduate and graduate courses in several Chinese universities. China Jiliang University, Zhongnan University of Economics and Law, and Huazhong University of Science and Technology all offer courses specifically in standardization and quality management. Having access to such courses at the undergraduate and graduate levels will prepare future legal, policy, business, and technical professionals to leverage standards and conformance solutions, or even encourage students to pursue careers in the standards and conformance field. While advantageous to students, such programs also develop a valuable resource of professionals with competence in standardization that can fill a growing void in businesses. In addition, China has extended curriculum development to current professionals through the publication of several textbooks covering a variety of topics relevant to standardization, including a textbook on international standardization and enterprises participating in international standardization activities.

More often, when standards education is incorporated into formal education, the subject of standards is very rarely allotted a standalone curriculum. It is simply built into existing curricula for which knowledge of standards can be particularly useful (e.g. engineering, architecture, public policy, etc.). Faulkner University in the United States provides an example of specialized undergraduate-level courses in Information Design and Evaluation, covering ISO standards and American National Standards (ANS) as part of the curriculum. While the importance of standards to this field has been covered in the Faulkner course, the university recognizes the importance of moving towards a more practical approach, allowing students to

evaluate and select standards in relation to specific designs used in project assignments.

Case Study: The Catholic University of America

The Catholic University of America (CUA) is at the forefront of standards education, having offered their first standard course in August 1999. This interdisciplinary graduate course, entitled “Strategic Standardization,” is intended for graduate students in the field of engineering, law, and business. The objectives of the course are to provide an introduction to the basic principles of standardization and conformity assessment. Underlying themes for the course are the systems aspects of standardization and the increasing importance of international standards to the global economy. The broad range of topics covered includes health and safety standards, the environment, trade and technical barriers, competition, ethics, certification, and international standards. The course draws extensively on perspectives from guest speakers from industry and government.

Similarly, in Chinese Taipei, promoting the development of telecommunications enterprises has been identified as a national priority. Within the sector, collaboration with the Ministry of Education to develop curricula for education programs in standardization related to the field of telecommunications is highly encouraged. Although no specific examples were given explicitly in the survey of curricula formed at the secondary, university, and graduate levels, responses indicated that such education programs are already underway in Chinese Taipei.

3.3 Standards Education Targeting Educators

In economies like the Republic of Korea, China, and Chinese Taipei, where formal education curricula has emerged – either incorporating the subject of standards into relevant courses where knowledge of standards is necessary or focusing directly on standards as the course’s principle subject – recognition for the need to teach educators has developed in parallel. Because the subject of standards is highly technical, those individuals who are most knowledgeable in the field do not always have the pedagogical skills to transmit that knowledge effectively. Often, the role of “standards professor” within universities is filled by experts in the field whose lack of teaching skills hinder students – particularly students from non-technical backgrounds – from acquiring any real understanding of the subject. At the same time, effective professors with strong teaching capabilities are not necessarily standards experts and may not always provide accurate information on standards. Recognizing that the true standards expert with exceptional pedagogic skills is most likely a rare commodity, “Teach the Teachers”⁵ (“T3”) programs allow more interaction between the teachers and the experts. In this context, standards experts can contribute to their colleagues’ more precise understanding of the subject while teaching experts can provide advice on more effective pedagogy.

⁵ Sometimes referred to as “Train the Trainers”

Currently in the midst of developing plans to incorporate the subject of standards into formal education at the secondary, university and graduate school levels, Thailand has applied a more comprehensive approach to introducing standardization into formal education. The Thai Industrial Standards Institute (TISI) has assisted in implementing the “Project on Integrating Standardization in Education” beginning with the secondary school level. The project aspires to “teach the teachers,” or provide the secondary school teachers with the necessary knowledge and understanding of standardization, in concurrence with the development of a secondary school curriculum on standardization and of training manuals and textbooks. With the completion of this phase, similar projects are foreseen at the university and graduate school levels.

T3 training programs also have been developed in Malaysia with the aim of increasing general consumer awareness. Although standards-specific curricula have not yet been developed there, the importance of encouraging the general awareness of primary and secondary school students as consumers has been identified as a national priority. In efforts to address this goal, programs have been initiated to allow teaching professionals to transmit what they have learned to a much larger audience. Teachers are instructed on the importance of standards to the safety of consumers and how to educate students as young consumers about the importance of standards in fun and engaging ways.

3.4 Standards Education Targeting Industry Professionals

With the emergence of an increasingly globalized economy, standardization has had a growing impact on several global industry sectors – especially those with rapid technological advances and/or heavy regulation (such as the information technology, telecommunications, and textile sectors) – and on certain professional functions (such as individuals working with copyrighted technology). Some APEC economies have shown sensitivity to these issues and have increased standards education efforts directed towards professionals within specific industry sectors.

Case Study: Training Programs for Professionals in Hong Kong and Chinese Taipei

Chinese Taipei has been particularly active in developing training programs targeting professionals in high priority sectors. The Taiwan Accreditation Foundation (TAF) has carried out training sessions for laboratory directors on both testing and calibration, specifically addressing the respective accreditation processes and ISO standards requirements. Advance Data Technology, Ltd. has trained working-level staff from the telecommunications sector in the approval procedures of low-frequency radio devices and terminal equipment. More general training for the telecommunications and electronics sectors has been performed by Telecommunications Laboratories Chunghwa Telecom Co., Ltd. and by The Electronics Testing Centre in Chinese Taipei for working-level staff.

In Hong Kong, the government’s Innovation and Technology Commission has provided a series of standards-related information to local enterprises meant to increase their awareness of local and overseas standards and technical regulations directly affecting their business. Such programs prepare companies for the

mandatory and de facto requirements that they must eventually meet when exporting goods.

Likewise, some countries have made similar efforts to prioritize industry sectors within their own domestic markets and to train professionals how to navigate national regulations. The Singapore Manufacturer's Association has organized a certification training course for professionals in the cold chain management industry. This program trains or reacquaints industry professionals with the knowledge necessary to ensure quality and safety in the cold chain management process, thereby protecting consumers. In addition to covering basic national regulatory requirements, the training also addresses topics of importance specific to the cold chain management processes and to the standardization of cold chain management. In the United States, UL University has responded to many similar specific industry needs by tailoring its classic standards training programs to a specific audience. An example includes a training workshop for the consumer electronics and electrical appliance industries.

With a rising concern for the protection of intellectual property rights in the United States and growing ramifications for violating them, Intellectual Property Shield has developed an on-line certification course targeting professionals working regularly with copyrighted standards and technical documents. The course is structured around understanding the principle of copyright, U.S. copyright laws, and how to properly use copyright protected documents.

3.5 Standards Education Targeting Conformity Assessment Professionals

One of the main objectives of a SCATR education and outreach strategy would be to combine the subjects of conformity assessment and standards in training programs. Involved in a highly technical field, conformity assessment professionals currently benefit from many training initiatives that would be of interest to standards and non-standards professionals alike. In addition to the training initiatives that have been performed to increase general awareness of the importance of conformity assessment, the targeted training of industry professionals is also a priority.

Case Study: A2LA Training for Laboratory Accreditation Professionals

The American Association for Laboratory Accreditation (A2LA) has developed a series of courses to help a broad range of professionals involved in the laboratory accreditation process to interpret the requirements of the ISO/IEC 17025 standard. This standard is of particular importance to laboratory accreditation professionals as many rely on ISO/IEC 17025 requirements for assessing the competence of testing and calibration laboratories. A2LA's training course covers the application of ISO/IEC 17025 and the laboratory accreditation process in addition to more technical subjects such as the evaluation of laboratory documents, quality manuals, and laboratories' internal quality audit programs. In addition, A2LA has sponsored technical training courses for testing and calibration laboratory personnel. Relying on active participation through a series of group exercises, the association developed a training seminar that addresses measurement uncertainty and includes exercises in developing uncertainty budgets. Another course investigates the applicability of

quality assurance analysis tools to metrology and testing, specifically in the data gathering function.

3.6 Standards Education Targeting Consumers

With the variety of products and services available in the marketplace, there is an increasing need to educate consumers about SCATR. Consumers should understand the impact that standards have on their everyday lives and be able to recognize marks of conformity. They should also be encouraged to participate in the development of standards for products and services used by consumers.

Case Study: Raising Consumer Awareness of Standards and Conformance in the United States⁶

Through its years of experience in training, Underwriters Laboratories (UL) has learned that efforts to address the safety of products are ineffective unless the product is used correctly by the end consumer. The organization has invested in public outreach and awareness campaigns to help consumers understand the benefits of third party certification, including what makes a certified product safe and why it is important to use the product correctly. This outreach includes providing the media with statistics and information on products with high instances of misuse.

For example, UL working in partnership with the National Association of State Fire Marshals, the U.S. Consumer Product Safety Commission, and the Association of Home Appliance Manufacturers, has supported a major initiative to prevent fires arising from cooking stove misuse, a leading consumer product hazard leading to deaths and injuries in the U.S. Efforts in this area have included targeted door-to-door outreach to the population segment with the highest instances of cooking fires, developing educational videos on proper stove use and making these available to media and retailers. UL also works closely with public television stations in the United States to advance consumer education on the dangers of product misuse. Similar initiatives also exist for other products where proper use is critical to safety, such as carbon monoxide detectors and power generators.

3.7 Technology-Based Standards Education Outreach Initiatives

Many economies in the APEC region responding to the survey indicated that exploring and using web-based technology as a standards education tool is a part of their national strategies. The use of such tools for standards training has already been implemented by various standards organizations. Notably, UL University and ASTM International have been using a variety of mediums to make their training seminars available to a wider audience.

Case Study: ASTM International and Web-Based Training

⁶ See Annex B for complete case study.

ASTM International has been able to target university and graduate level students by making web-based learning modules available online. These modules cover a variety of topics, from international standards development processes and procedures to the issue of intellectual property rights and how standards can protect them. In addition, ASTM has been able to provide, via the Internet, a series of downloadable tutorials designed for professionals instructing them how to participate effectively in voluntary standards development fora.

3.8 Public Relations- Based Standards Education Outreach

In the SCATR knowledge pyramid⁷, it is recognized that many professional groups can be categorized as “aware.” The goal is to push these groups to recognize and understand the importance of SCATR and how it impacts them. In this case, in-depth training seminars may not be the answer. Certain professional groups, such as government officials and business executives, may not have the time or interest to invest in more formal training courses. Some organizations have taken this into account as they seek to inform such individuals of SCATR.

Case Study: ANSI’s Public Outreach

The American National Standards Institute (ANSI) has developed media tips and case studies as a resource for journalists, consumers, and educators/students. This online resource uses a non-technical format to demonstrate the role that standards play in daily life. A variety of topics are presented, such as drinking water, toy safety, and indoor air quality.

To educate government officials, ANSI works with its members to create outreach programs to legislators, to increase understanding of the private sector standards community among agencies involved in trade and commerce issues, and to provide testimony when requested by legislative committees. These efforts are intended to foster understanding among opinion leaders of the major role standards play in the international and domestic marketplace.

In the United States, the Office of the U.S. Trade Representative plays an important role in negotiating and defending international trade agreements. As discussed earlier, international trade agreements have increasingly taken SCATR into account as technical barriers to trade are erected in a protectionist manner. Consequently, important U.S. government actors managing trade relations must understand SCATR and the complex U.S. approach to SCATR development to effectively represent the United States in the international trade community. In order to educate government officials on the U.S. standardization system and on the concerns of its members, ANSI developed a white paper addressing the importance of SCATR in their professional field.

To educate industry, especially corporate executives, about the benefits of standardization, the ANSI Company Member Forum is developing a series of key messages to explain the importance of standards to business leaders.

⁷ See Figure 1 (p. 2)

3.9 Undesired, Trade Restrictive Standards Education Outreach Initiatives

Some standards education initiatives exist in select APEC economies with content not supportive of the World Trade Organization's Agreement on Technical Barriers to Trade (TBT Agreement). Evidence suggests that such standards education initiatives teach protective practices. This can include training seminars to educate recipients on developing national standards that conflict with the stipulations of the WTO TBT Agreement or the promulgation of such standards via widely accessible media venues. Unlike classic training initiatives, in these cases outreach to international stakeholders is non-existent and targeted recipients of the training and/or information are a strictly national audience. Although these education initiatives are designed to increase the development of economy-unique standards and consequently to protect the national economy by eliminating the presence of foreign competition, this practice actually harms domestic economies by isolating their markets. The result is that their economies enter a vicious cycle of continual deprivation of modern technology and, thus, persistently remain cut off from the global economy. However, entrenching an economy in sub-par technology can only cause damage in the long run. Because these practices are not advisable and seen as not beneficial to APEC economies, such strategies will not be further addressed in this report.

4 General Outreach Strategies

As evidenced above, it can be asserted that a growing emphasis on the need for standards education exists in the national priorities and strategies of several APEC economies. It is clear that a considerable number of these economies have taken initial steps towards enlarging the scope of their standards education programs and that the lessons they have learned in doing so can be effectively applied to the development of a more general standards outreach initiative.

From these experiences, two principal strategies would improve the effectiveness of standards education programs, thus encouraging the expansion of similar programs. To attract a greater number and more varied scope of training participants, standards training programs must be (1) contextually relevant to its recipients and (2) must optimize their pedagogical approaches by including engaging methods.

4.1 Contextual Relevance

Feedback from many of the survey's respondents reveals that standards training initiatives must have contextual relevance for the participants. This can include elements as varied as the history and culture of the target audience's native economy to an individual participant's personal objectives in attending the training course. A training program should take many considerations into account to ensure that is relevant to the majority of its participants.

First, when training is done internationally, it is important to remember that the applicability of many SCATR concepts depends greatly on the political and cultural context in which they will be applied. For example, what may be effective and applicable in a decentralized economy with a common law legal system, such as in Australia, Canada, New Zealand, or the United States, may not be as feasibly implemented in a centralized economy with stronger "top-down" government regulatory structures and vice versa. Educators should tailor their training programs and messages to reflect political and societal differences. Likewise, this implies that organizations wishing to implement standards training programs in foreign countries should perform the necessary research to be informed of the economy's legal

parameters. This includes researching what is voluntary and what is mandatory, and what is market-driven and what is government-driven, before carrying out training.

With standards education initiatives reaching beyond international borders as well as traditional audience spheres, it has become increasingly important for trainers to tailor their language to target audiences when teaching about standards. In the case of international audiences, this can include either the need to translate standards terminology or use relevant terminology in a common language. Additionally, considering the enlarged scope of targeting training participants from the traditional group of standards professionals to groups as varied as students, industry-specific professionals, and government officials, it is also imperative to recognize the various interpretations of standards terminology that can exist.

Awareness and acknowledgement of the meaning that “standard” or “voluntary” might take on for a student or a professional outside of the standards community can be used as common ground and a basis for introducing such an audience to the commonly accepted definitions of these terms within the standards community. To effectively tie training content to the target audience’s needs, the trainer should be prepared to become familiar with the participants’ professional languages and any related languages to the industry sector in which they work.

Standards Defined

The terms “Standards”, “Technical Regulations” and “Conformity Assessment” are defined by the World Trade Organization, under the Technical Barriers to Trade Agreement:

Standard – Document that provides, for common and repeated use, rules, guidelines or characteristics for products or related processes and production methods, *with which compliance is not mandatory*. It may also include or deal exclusively with terminology, symbols, packaging, marking or labelling requirements as they apply to a product, process or production method.

Technical Regulation – Document which lays down product characteristics or their related processes and production methods, including the applicable administrative provisions, *with which compliance is mandatory*.

Conformity Assessment (Conformance) – Any procedure used, directly or indirectly, to determine that relevant requirements in technical regulations or standards are fulfilled (e.g., testing, certification).

Source: World Trade Organization Technical Barriers to Trade Agreement, Annex 1:
http://www.wto.org/english/docs_e/legal_e/17-tbt_e.htm

These internationally and legally binding definitions have helped to standardize and address related definitional issues in WTO member economies.

An increased scope of standards training participants also means that education initiatives must increasingly speak to the direct impact SCATR may have on the

participants' professions or, in the case of students, on their career paths. While the traditional training recipients of standards professionals are interested in learning about standards for standards' sake, students and other non-standards professionals need to clearly understand the relevance standards have on their chosen professions. Many individuals and professionals who work outside of this field may not realize the important impact standards risk having if they are overlooked. Many professionals often neglect the strength and influence that having knowledge about standards can bring to a company within an industry sector, especially in a global economy. Drawing these groups to standards training may also require developing programs that are centered on more topics with broader interest (e.g. engineering, architecture, international relations, market access, etc.) and with a segment of the course dedicated to the role of standards. This is particularly true in the institutions of economies where national standards bodies or the government does not have the authority to define curricula or technical training requirements.

Finally, expanding the range of standards education recipients also requires understanding why certain individuals may be drawn to a training course on standards and customizing the course to respond to the individual's needs to the greatest extent possible. More specifically, a training course should have a clear objective and scale the quantity of information presented, leaving the option for follow-up instruction open. The course objectives should respond to the direct needs of the vast majority of individuals in the training audience. Determining appropriate course objectives could involve surveying recipients in advance to assess their interests and priorities. If directed at professionals within a specific industry sector or students studying a specific subject, this could also involve researching the audience's field of interest and implementing training materials that directly correspond to existing issues in this field.

4.2 Preferred Pedagogical Methods

4.2.1 Holistic Training Approach

Emphasized above, a need to present SCATR in a comprehensive manner, demonstrating how standards, conformity assessment, and technical regulations depend upon one another, is increasingly a priority for SCATR education and outreach. Likewise, SCATR training participants also expressed a partiality for the comprehensive presentation of SCATR principles within a particular industry sector. While most readily recognize that SCATR can affect how a single product is manufactured within their industry sector, many often overlook the personnel and service standards that affect their industry sector. When informed of the various SCATR mechanisms important to their industry respective sectors, training participants prefer that these be introduced to provide a full picture of possible SCATR-related obstacles.

4.2.2 Active Participation

Many participants in standards education training seminars have expressed a preference for practical exercises coupled with the theoretical knowledge presented. Successful examples include case study exercises, inclusion of standards and conformance-related components in simulations, or internship opportunities with SCATR professionals. Including opportunities for active participation obliges training

participants to explain what they have learned and to prove that they have understood the material correctly.

While theoretical lectures are effective as an introduction to concepts in training programs, active participation exercises, such as simulation and case study exercises, implant that knowledge by giving participants first-hand experience of working through a problem in a cooperative, non-threatening environment. In addition, presentations and groups exercises may expose training participants to different approaches and perspectives on solving a problem. Such exercises may also introduce participants to approaches that appear to be - but may not necessarily be - viable as a solution.

4.2.3 Real-Life Experience

In many cases, training initiatives are very successful if participants are provided with tangible examples of the standards developing process. This can include a variety of methods. Case studies present examples of the successful implementation of SCATR, comparing and contrasting these with unsuccessful examples. Presentations by field experts give training participants a more realistic picture of how standards are developed, the complications that can arise in the standards development process, and how such problems have been resolved in the past. Participation in technical committee meetings can put theoretical classroom knowledge into context for training participants. Such real-life experiences can provide an effective means for demonstrating first-hand evidence of the impact that standards development can have to training participants.

4.2.4 Team Teaching

Training participants also express a preference for having several instructors from different backgrounds. This method gives training participants exposure to different perspectives, wider experience, and a vast range of expertise. In addition, it breaks up the monotony that may result from engaging a single instructor throughout the training course.

4.2.5 Training Participant Input

Training recipient evaluations and surveys provide useful feedback to instructors on how well a training course was received. A large quantity of positive feedback from participants is an indication of how likely the group will be to recommend the training to others. By regularly analyzing and assessing input from training recipients and applying this to future training methods, instructors may increase the attractiveness of the training course to potential participants.

5 Organization-Specific Recommendations

In addition to structuring standards training to be more attractive, both through accommodating the training program's target audience and providing engaging pedagogical methods, more proactive outreach methods can also be conducted by those organizations currently engaged in SCATR training. This includes identifying several organizations that are prime targets for receiving increased training in SCATR. To encourage the continued growth of standards education initiatives within active organizations, it is necessary to understand the specific motivations that may lead these organizations to perform standards education outreach. Recommendations can then be made to this vast group of organizations already engaged in standards training, including government agencies, standards developing organizations (SDOs), conformity assessment bodies (CABs), national standards bodies (NSBs), and international and regional standardization bodies. In order to involve more organizations in standards training initiatives that have not yet participated as training recipients in this realm and thus expand the overall reach of SCATR education, organizations that are appropriate for such training will be identified.

5.1 Organizations Conducting Standards Training

For organizations that are already involved in this type of activity, specific recommendations for improving training initiatives should focus on organizational objectives for carrying out standards training programs. In general, the training initiatives carried out by most of these organizations aim to promote the principles of SCATR, agreed upon within the APEC community.

More specifically, APEC does not develop regional standards. Rather, each APEC member is dedicated to clearly identifying – in full transparency – all of the mandatory, voluntary, and conformity requirements to access their respective markets. This not only facilitates trade within the region, and to and from the region, through improved market access, but also endorses a trade and innovative friendly approach that allows each economy to converge toward the common goal of “one standard, one test, accepted everywhere” (1:1:1) at a pace that is appropriate for their industries, consumers, governments and other stakeholders.

In addition, many APEC members conduct standards training initiatives to reinforce their organization's role as a leader in setting and developing standards. By providing training recipients with information on their standards and standards developing processes, an organization is subsequently ensuring that knowledge about its practices is available and can be easily implemented.

Academic organizations may have an interest in SCATR training to promote its reputation or the reputation of an individual professor. As a topic of growing significance in international relations, public policy, business, law, etc. with few true experts currently in the field, broaching the topic of SCATR through academic courses and papers could be very beneficial to the reputation of these institutions. In addition, as no single university is currently recognized as the lead institution for studies in SCATR, this could also provide those that wish to pave the way for standards education with a national renown for standardization programs. As

students realize the impact SCATR can have on many professions and as organizations increasingly demand SCATR professionals, having set curricula in which SCATR is taught could attract a competitive student body seeking education in these matters. Individual professors, looking to author papers on new subjects and to put forth original ideas, may increasingly turn to SCATR issues as they continue to influence a wide variety of professions.

Standards developing organizations and conformity assessment bodies may have several incentives for performing standards training. Generally, they endeavor to raise awareness of and to promote their organization's specific solutions. Additionally, many have relationships with academic institutions, specifically with professional programs within an academic institution, as well as recognized in-house professional development programs.

National standards bodies tend to perform education outreach in standards to raise awareness of standards and conformance in general. Republic of Korea's leadership in introducing SCATR in the formal primary, secondary, and university curricula serves as an example. They also conduct training to support societal and government objectives. This could include trade, regulations, social and economic development. ANSI's involvement in promoting trade policy one-page papers⁸ demonstrates the priority it places on informing U.S. trade agencies of the importance of SCATR.

Representatives of the governments of APEC economies may also carry out their own training initiatives to increase domestic industry capacity to meet the SCATR demands of international requirements. China's emphasis on educating professionals in its telecommunications industry on SCATR is a good indicator of their commitment to similar training activities.

5.2 Target Organizations for Outreach

With regard to organizations that are ideal for receiving increased SCATR training and outreach, there are several strategies that can be employed to encourage these organizations to participate in SCATR training activities. Organizations that could be prime targets for SCATR training education and outreach include:

- the APEC organization, including staff and representatives of its member economies in key APEC fora;
- institutions that execute international and regional development programs;
- multilateral political , economic, and trade organizations;
- business executives and professionals;
- trainers and consultants;
- industry;
- government leaders;
- think tanks;
- press and media; and
- academic institutions.

⁸ See Annex 1

6 Academic Outreach Strategies

While some APEC economies have already begun developing and implementing curricula for standards education, it is recognized that an APEC Education Initiative must place special emphasis on promoting standards education and outreach to academic institutions. Students are both the future professionals that will determine the path standards development takes and the voice for greater promotion of SCATR education.

Among other goals, the APEC Strategy for Education and Outreach on SCATR will plan to implement tactics for promoting standards and conformance course materials in academic disciplines as well as methods for building and operating academic and professional networks for SCATR education. The implementation of an outreach strategy will take into account several considerations in order to focus efforts. The following methods for reaching out to the academic community are especially relevant in decentralized “bottom up” governmental systems, such as those of the United States and Australia, where educational curricula cannot be defined by federal institutions and is determined by a local school district or private institutions. While some APEC member economies operate in a more centralized governmental environment and curricula can be imposed by the government, decentralized systems must use the following principles as a basis for promoting SCATR-related curricula. However, centralized systems can also benefit from such methods to establish curricula that meet students’ needs.

6.1 Determine the Objective

When developing SCATR-related curricula for academic institutions, it is necessary to determine, first and foremost, the objective of introducing SCATR as a subject. More specifically, institutions must identify disciplines where a general understanding of SCATR could be beneficial to students and where a more thorough expertise of standards may be required. For example, in many academic disciplines, an understanding of how SCATR impacts businesses, commerce, and consumerism could largely suffice as the need for detailed knowledge of SCATR is rare. However, in more technical disciplines, more comprehensive coverage of SCATR may be deemed necessary. Before advancing a curricula among academics, it is important to acknowledge these different requirements.

6.2 Determine Interlocutor

In addition, the strategy considers the importance of identifying the most appropriate interlocutor, academic institutions and their administrative staff or individual professors, and will thus judge which to engage in the outreach process. While an academic institution may be motivated to increase the competitiveness of its reputation, an individual professor may also be a viable advocate for programs that will improve his personal reputation. In the case of standards education, it is important to determine which category would have a greater drive to promote standards education and to then design an outreach approach with these factors in mind. Some additional elements that may encourage an institution’s or an individual professor’s objectives in pursuing the implementation of a standards education program would include monetary objectives in addition to visibility and reputational objectives. How will these be identified and whose objectives are most feasibly met?

Determining an appropriate interlocutor will also be influenced by whether an institution is part of a centralized, “top-down” governmental system or part of a decentralized, “bottom-up” system. In the former, the government has a much stronger role in establishing curricula while, in the latter, curricula are developed by the institutions themselves. In promoting SCATR education, the proper decision makers to be identified at each stage of promotion and the approach in interacting with them must be taken into account. While “top-down” systems may have more success in implementing a SCATR-related curricula, these actors can still benefit from the approaches suggested to “bottom-up” systems, by placing special attention to gathering student interest in SCATR-related curricula. Both systems should then encourage networks to facilitate information exchange, publish successful SCATR case study models, and prove the social and professional value of networking to professors.

6.3 Identify Target Disciplines

Once an interlocutor has been selected, target disciplines for standards education must be identified. Although certain APEC economies have been successful in building standards-specific curricula in their formal education systems, a more general strategy for all APEC economies must include “stepping stones” for reaching the same degree of activity within this realm. It is important to recognize that, for the institutions and professors implementing new courses, a political risk is involved.

It is unlikely that a course strictly focusing on standards would be selected by students who do not have previous knowledge, interest, or understanding of the career impact of standardization. Thus, as a first step, it is most efficient in “bottom-up” institutions to first work to raise basic awareness of SCATR in more recognized disciplines. Therefore, specific disciplines must be identified in which it is practical to implement a course on standards. Technical disciplines such as engineering are the most easily linked with standards education. However, training in standards could be relevant to a wide variety of other university students.

Taking into account the wide variety of professions that law students pursue, standards training could be very relevant to their potential career choices. For those that do pursue professions in law, large law firms are increasingly taking on corporate, non-profit and association clients that deal with standards development. Companies are being sued on an average of eight times per day for internal company standards. Potential claims include negligent development, failure to warn, fraud, and conspiracy. Corporate attorneys and in-house counsel need to understand these internal standards processes for corporate risk management. In addition, there is a high risk of tort liability for standards developing organizations as standards are developed for market products and, as SDOs increasingly run the risk of being sued, there is a growing need for attorneys to understand standards and the standards development process.

Law students are also increasingly pursuing professions in government, non-profit organizations, and professional associations. As trade globalizes, professionals in each of these three categories are increasingly being called to understand the role of standards. For example, international law students and government contract attorneys need to understand standards and standards development to enforce international trade agreements (such as those of the World Trade Organization), and to better understand the private sector roles in the standardization and regulation processes.

As economies globalize and standardization increasingly involves greater international cooperation, an increased need for students with multicultural experience has developed. Standards training could be introduced to International Relations and International Policy students by incorporating information on SCATR and standards development into course material on international trade. Not only would this demonstrate the natural links that occur between international trade and standardization, but would also show how standardization plays an important role in the diplomatic relations of governments.

Increased international cooperation in business has revealed that standards education is relevant for Business Management students as well. The traditional realm of business interaction has expanded from a domestic market, where accepted standards and conformity assessment practices are familiar to industry professionals, to an international market, where a role that is currently not adequately filled in businesses still exists to investigate the variety of international practices. Where businesses could historically rely on the accepted standards and conformity assessment rules within their respective countries to remain competitive, they must now play an active role in monitoring developments in foreign countries, participating in international standards development fora, and learning the requirements for exporting internationally to maintain the same level of competitiveness. This opens up an opportunity for business students to become involved in standards development in this capacity.

6.4 Provide Incentives

Another strategy for gathering the interest of potential university-level students in standards training is to provide incentives for studying standards and conformity assessment and to highlight the positive elements that a career in standards may have. For the groups listed above, the idea of studying standards may appeal to a select few, notably engineering students and students in a more technically-oriented field of study. However, in regards to the majority of disciplinary groups discussed above, students would not necessarily consider the topic of standards attractive or recognize the direct link it has with their chosen career path. In many cases, students may even be unaware of what standards are.

However, a profession in standards consists of several incentives that young professionals seek. First, with growing international cooperation in this field, the opportunities for international travel are considerable. In addition, professions in standards and conformity assessment are still in development. Even if the student does not go on to become a “standards professional,” a basic awareness and understanding of standards will help them do their jobs more effectively and to be more successful (example: business executive with market access barrier; regulator; policy expert; etc.). In other words, professionals with knowledge of standards and conformance are increasingly in demand as discussed above and, given the technical competence required to perform this work and its relevance across a variety of professional sectors, positions in standards also promise long-term job security. Finally, access to professional experience in standards is widely available through internships while scholarships are provided to students who pursue studies in standards.

6.5 Scale Course Content

For individual disciplines, it will be important to consider the depth and breadth of standards-related content in relation to the course being taught. Although it may be appropriate for engineering or business management courses to dedicate several lectures and a large quantity of course materials to standards development, this may not be the case for Political Science and International Relations students. Any outreach performed to incorporate standards training into the curricula of a specific discipline should assess the tolerance level students might have for the subject of standards in relation to their career goals and use this as an indicator of what to advocate in a each individual situation. Often, short case studies, modules, or practical exercises introduced as a single element of a larger course may adequately serve the purpose of introducing the concept of standardization without overemphasizing it among students for whom awareness of SCATR will suffice. Referencing the “knowledge pyramid”, the objective in some disciplines will be to raise the “unaware” located outside of the pyramid to the level of “aware”, to emphasize that SCATR exists and will impact their careers.

6.6 Leverage Current Events

In recent years, current events have featured stories covering examples of the breakdown of standards and conformity assessment procedures. This serves to raise awareness of SCATR with all sectors - consumers, government authorities, industry, and academia. The standards community should take advantage of these opportunities to provide additional information relevant to their sectors.

Case Study: Communications and Building Standards on September 11, 2001

One of the lessons learned from the 2001 terrorist attacks on the United States is the need to enhance emergency response capabilities of public safety officials and first responders at all levels of the government nationwide. The communications difficulties that first responders encountered on September 11, 2001 highlighted serious problems in emergency communications systems that affected law enforcement, fire and rescue, medical workers, and other emergency management personnel from multiple jurisdictions. Standards for interoperability and compatibility in equipment, communications, and in first responder training are essential to addressing these problems. The U.S. Department of Homeland Security Science and Technology Division Office of Interoperability is working with standards developers and the private sector on a number of standards initiatives such as implementing a central communication relay base that will provide the necessary filtering for any one responder to be able to talk to another.

In addition, the United States National Institute for Standards and Technology (NIST) made recommendations for building standards following September 11, 2001. An investigation revealed that, while some building standards contributed to maintaining temporary structural integrity of the Twin Towers, improved construction standards must be used in the future. These included reinforced structural integrity through the reduction of mitigating conditions, such as wind load, that could result in a building's progressive collapse and the improvement of fire protection and evacuation routes in the event of a fire.

Case Study: Recent Bridge Collapses in the U.S. and Vietnam

Recent bridge collapses in the United States and Vietnam point to the need for a review of the current standards. A National Transportation Safety Board safety recommendation addressed a design issue related to the August 1, 2007 bridge collapse in the state of Minnesota, stating that there was a breakdown in the design review procedures that allowed a serious design error to be incorporated into the construction of the bridge. Similarly, incorrect use of standards may have been a factor in the collapse of the Cần Thơ Bridge on September 26, 2007.

Media coverage often underscores the wide variety of actors that are involved in a crisis situation including domestic and foreign government officials, government agencies, international organizations, corporations, trade associations, legal experts, and consumers. Highlighting such media coverage as it breaks, during the outreach process, may provide an effective means to demonstrate why knowledge of standards is useful and generate interest in more course material dedicated to this topic among students.

7 Vision for the Future

The incentives for the standards community to amplify education initiatives in standards and conformity assessment are many and reach across several professional communities. By increasing efforts in standards education, the standards community aims to meet a wide range of objectives within the APEC community, the business community, the regulatory and legislative communities, the academic community, the trade policy community, and the technical and scientific communities. The strategy will outline reasonable short- and long-term objectives for promoting standards outreach and education in the APEC region and will identify recommended next steps for implementation. These objectives will, likewise, address concrete deliverables, projected timelines, and measures of success.

7.1 Overarching Objectives

Among the communities specified, many objectives identified by the strategy are overarching and can be seen as a valid goal for each. The standards strategy proposed in this report generally aims to bolster a stronger dimension of international cooperation through several means. This includes increasing recognition for the important role that national standards bodies can play as a resource and coordinator of often varying policy positions. Educating both students and professionals outside of the standards community of what the accepted venues and efficient practices are for addressing standards-related problems will facilitate more streamlined responses.

Greater international cooperation and cooperation within APEC will also require a reinforced focus on globally-relevant standards, as opposed to regional or national standards. Properly structured and applied, international standards can help facilitate international trade and increase the competitiveness of domestic markets while the development and adoption of regional- or economy-unique standards risk stalling

technological development, entrenching markets in inferior technologies, and inhibiting long-term trade potential. Countries using international standards are granted entry into markets that use international standards because their specifications for products, services, and systems are internationally recognized. This helps to reduce costs, enable commerce and trade between countries via the interoperability of technologies, and promote innovation and economic growth.

With this in mind, the strategy will also attempt to promote internationally accepted criteria for the standards development process, as defined by the World Trade Organization's Technical Barriers to Trade Agreement, including openness, transparency, consensus, balance, and due process. Globally-relevant standards should increase stakeholder participation and consultation and should involve as many relevant stakeholders as possible, including government officials from APEC economies, policy makers, companies, and other actors. Involving a variety of stakeholders in this process ensures that standards meet the needs of standards users and that their considerations are taken into account in standards and conformance activities. In turn, this increases the probability that these standards will be well received globally. In order to increase the involvement of these key communities, and the policy and technical communities in particular, a SCATR education and outreach initiative would encourage an increased investment in participation in international SCATR fora.

When existing standards and conformity assessment measures are already in place and harmonization is required, as opposed to when international standards must be developed, the strategy will similarly support the message that this should be achieved through market-relevant means, emphasizing the need to facilitate rather than limit SCATR-related policies, activities, decisions, and solutions. In addition to increased transparency extended to actors with a stake in any changes that could result from the harmonization process, this can also include endorsing a strong message that standards and conformance measures should be evaluated irrespective of where the measure was originally developed.

7.2 Objectives for the APEC Community

The greater APEC Community has expressed special interest in the development of a SCATR education and outreach initiative. Channeling the willpower of APEC decision-makers into a focused effort to promote SCATR education and outreach should be done while it is still a priority for member countries' leaders and has been embraced by the SCATR communities of these member economies. Improving SCATR education and outreach within APEC member economies alone is already a healthy launching point since many members are emerging economies that are increasingly influencing the international SCATR landscape. However, it is hoped that amplified SCATR education and outreach in these key economies will advance efforts internationally as well.

The principal objectives that a standards education and outreach initiative would have for the APEC Community would involve eventually providing APEC ministers, leaders, and business leaders with the administrative knowledge for managing standards and conformance issues within the APEC organization. In addition to assisting in the development of APEC officials' content knowledge of standards and conformance, standards education should also aim to train these individuals to instinctively funnel issues pertaining to standards and conformance to APEC's Sub-Committee on Standards and Conformance. This would achieve a larger objective of highlighting the SCSC's role within APEC as the first stop for standards and

conformance issues, relying on the expertise of the APEC Specialist Regional Bodies in the areas of standardization, accreditation and metrology.

7.3 Objectives for the Business Community

As discussed earlier, when crisis situations involving the breakdown of standards emerge within an organization, business professionals are often under pressure to respond quickly with solutions. Oftentimes, previous knowledge and understanding of the existing standards and conformance processes would have prevented a crisis situation in the first place. In addition, limited knowledge leads to the assumption that stricter technical regulations are the answer.

A standards education outreach strategy that targets key stakeholders in the business community would aim to educate companies' employees on how to become proactively involved in the SCATR process. More specifically, this would require establishing routine business processes to identify, define, and address SCATR issues and informing Chief Executive Officers of the importance of SCATR so that they will readily invest time and money into voluntary standards and conformance activities. More active involvement among companies in these activities would create greater appreciation for the voluntary mechanisms that already exist and that save their organizations considerable time and money.

While the current instinct in the business community is to petition government for more technical regulations in response to issues, voluntary mechanisms at the very least usually suffice to meet their needs and are often even *more* efficient. Furthermore, participation in the appropriate SCATR fora would create the broad understanding that solutions to many of the issues will come from market-driven user-led approaches. Being aware of which fora are appropriate for addressing specific issues will benefit businesses by providing more efficient and effective responses.

7.4 Objectives for the Regulatory and Legislative Communities

The regulatory and legislative communities of APEC member economies play an intrinsic role in the implementation of SCATR policy. While in decentralized standardization systems, these communities must consider input from the private-sector and implement voluntary SCATR mechanisms wherever applicable, centralized "top-down" systems do not have such restrictions. Often, the national standards body (NSB) in such systems is a part of the government and the regulatory and legislative communities effectively determine what SCATR policy in international trade will be implemented by the NSB. In decentralized "bottom-up" standardization systems, regulators and legislators may be required to seek input from stakeholders in a voluntary consensus process. However, they can still be very influential in the outcomes of SCATR policy, especially when a SCATR issue is particularly controversial or has received a large amount of media attention. Therefore, an APEC SCATR education and outreach initiative must set specific goals for this community in each APEC member economy.

As it is the reflex of the business community to request more stringent standards and technical regulations from the regulatory and legislative communities, it is often the response of the regulatory and legislative communities to focus on creating these. While writing more stringent standards and technical regulations may seem like a natural solution to breakdowns in the application of SCATR, this typically creates a greater burden for those who would enforce such regulations. Leveraging the

voluntary standards development process wherever possible can lift these burdens and ensure that, when technical regulations are developed, their efficient enforcement is certain.

Therefore, the standards education outreach strategy would also seek to highlight the need for *better* regulatory practice, not simply more technical regulations, and to promote regulators' and legislators' recognition of the voluntary mechanisms available to achieve harmonization as well as environment, health, and safety objectives. Creating better regulatory practice and implementing voluntary mechanisms when applicable requires the three-point approach of improving the efficiency of technical regulations, effectively enforcing regulations, and ultimately creating a compliance culture.

In order to improve the efficiency of technical regulations, it is necessary to implement transparent government processes for their development where stakeholders have several opportunities to make their opinions heard and to have their technical expertise taken into account. In addition, it is important that technical regulations pull from the relevant standards or relevant elements of standards that already exist. This approach not only avoids duplicating the efforts of the standards developing community but also optimizes the investment of time and money that regulatory bodies may not otherwise be able to support and implements up-to-date and relevant technology being used in the field.

Likewise, effectively enforcing technical regulations requires providing regulatory agencies with the infrastructure and resources necessary to do so. In addition to leveraging existing solutions in the voluntary standards process, governments can rely more heavily on sharing enforcement activities with the private-sector to liberate time and finances. This includes developing conformity assessment schemes that rely on the neutral evaluation of a company's ability to meet technical regulations by a third party, private-sector organization.

Finally, while contingent upon the development of efficient and practical standards and the systematic enforcement of technical regulations, the long-term objective of developing good regulatory practice must be the creation of a compliance culture. When the consequences of non-compliance are too significant to risk, manufacturers will assume the responsibility of "self-policing" and companies will often voluntarily participate in compliance programs that are not mandated by government. Often, participating in such voluntary programs increases a company's competitiveness to a point where compliance becomes a requirement, *de facto* rather than *de jure*.

7.5 Objectives for the Academic Community

The academic community is essential to standards education outreach as both the first group of professionals with which future standards professionals will have contact and from whom they will form their initial conceptions of and interest in SCATR. Publishing a variety of policy papers, studies and texts related to SCATR, academics also serve as an important link to the greater public, effectively disseminating knowledge about standards and conformance to a vast audience.

However, academics have traditionally had little interaction with and input from practitioners in the field when treating the subject of standards in coursework and published work. In light of this fact, the standards outreach strategy proposes to respond to the isolation of the academic community through a variety of means. First of all, increased networking between these two groups will be encouraged. Providing venues where academics and standards professionals can discuss and debate

standards and conformance issues will expose the academic community to the practical realities of SCATR implementation from which theoretical perspectives and theories can be built. The existing strategies to confront this issue, such as the “Teach the Teacher” seminars described earlier hosted by standards professionals, will also be taken into account. Similarly, the outreach strategy intends to perform directed outreach by standards professionals to academics in order to arm them with the knowledge they need to write intelligibly about the standards and conformance processes. Finally, when accurate and complete knowledge is unavailable about a particular standards and conformance topic, the strategy will seek to educate academics to recognize and accept such situations and to avoid bridging such topics until information is available.

7.6 Objectives for the Trade Policy Community

Given the increasing link that SCATR has with international trade and the role that the trade policy community plays in the negotiation of international trade agreements, this community has a significant impact on recent trends in standards and conformance. Acting as the interlocutor for domestic businesses with the international community in trade issues and disputes, a SCATR education and outreach initiative must target trade policy professionals to encourage their improved understanding of the important role SCATR plays for business in these cases.

Therefore, another objective of the standards education outreach strategy is to positively influence the behavior of the trade policy community in dealing with general international trade practices and trade disputes. The trade policy community must, in order to promote a truly cooperative international environment, fiercely uphold decisions made within the World Trade Organization, recognizing this entity’s responsibility to facilitate and monitor international trade, and proactively encourage other WTO member bodies to abide by decisions made there. In addition, to maintain an impartial character and credibility in the international community, trade policy professionals must be able to differentiate between what is truly defined as “mandatory” in the international trade landscape as opposed to what actions are considered trade disruptive but not necessarily illegal if not followed. Often endeavoring to resolve trade issues for companies in their own economy’s domestic market, trade policy experts can sometimes misconstrue what is legally required and what is not in the international trade context. A lack of understanding of globally acceptable market practices in standards and conformance can often easily be misunderstood as illegal trade barriers. An objective of an APEC standards education strategy would be to help private and public sector parties more easily differentiate between legitimate business costs and true trade barriers.

7.7 Objectives for the Technical and Scientific Communities

Often, the technical and scientific communities are the knowledge base for the standards development process, understanding the value of developing technically relevant standards for business efficacy and technical innovation. However, within the majority of national standardization systems and business ventures, the technical expertise to be found within these communities is not adequately exploited. While, in national standardization systems, government employees often define the technical requirements for standards before the feasibility of these requirements can be determined, the administrative management of businesses often dictates to what extent their organization will be involved in the standards developing process. However, it is the technical staff who will be responsible for implementing the most

globally-relevant product design, costing governments and businesses dearly if their technology is behind that of others in the global market. SCATR education and outreach would ideally promote an understanding for the importance of technical staff's involvement in SCATR activities or at least encourage technical staff to instinctively research the current and future international SCATR requirements before finalizing a product design.

In addition, educating technical and scientific professionals would teach this group how to leverage their superior knowledge of technical issues in an effective manner thus enhancing their credibility. This includes educating technical and scientific staff to formulate concise, targeted messages when speaking to relevant decision makers. Such messages should quickly tie standards and other technical issues to identified topics that resonate with management in order to more effectively secure and maintain a budget for investment in standards and conformance activities. In addition, the technical and scientific communities can provide decision makers with first-hand evidence of how standardization activities act as a market relevant mechanism for technology transfer.

8 Conclusions

8.1 Related to Current Outreach Efforts

Earlier in this report, evaluation of current outreach efforts, based on a survey conducted in the APEC region provided some preliminary conclusions regarding the scope of SCATR education activities today. It determined that:

- (1) current standards education initiatives in most respondent APEC economies are relatively limited;
- (2) the vast majority of standards training initiatives target professional development rather than engaging formal education venues to teach about standards at a purely academic level;
- (3) standards training usually approaches SCATR from the single angle of standards, conformity assessment, or technical regulations; and
- (4) APEC member economies have recognized and prioritized the importance of performing SCATR education outreach while seeking out a variety of target audiences, from students to non-standards professionals, regardless of their current level of involvement in such activities.

With these initial observations in mind regarding SCATR training already underway, further conclusions can be asserted. First, where economies have defined SCATR training as a national priority, special emphasis must be placed on harnessing the momentum that such interest could imply. If a significant number of government decision makers and national standards bodies in the APEC region have identified amplifying standards education initiatives as part of their respective national strategies, coordinating a feasible action plan with these actors could act as a launching point for promoting broader standards education outreach.

Second, as a general SCATR outreach education strategy is formulated, it must place special emphasis on promoting holistic approaches to teaching standards, conformity assessment, and technical regulations as they relate to one another. While it is common for training initiatives to treat these subjects separately, they are inextricably related. Although there may be certain circumstances in which training individuals on each subject separately is necessary, a SCATR education outreach strategy will require identifying instances in which it is appropriate or desired to address SCATR in unison and demonstrating how these subjects are intertwined.

Finally, although promoting SCATR education in purely academic settings may seem a natural launching point for amplifying SCATR education training programs and should be a primary area of focus of the education promotion strategy, these activities must continue to promote SCATR training among a larger variety of professionals as well as among students. It has been determined that, to date, SCATR training is very widely performed among professionals that work directly in this field and that it is performed to a lesser extent among government officials, business professionals, and other non-standards professionals. However, SCATR training must increasingly target current leaders and future leaders who will have the authority to implement the practices and policies that the SCATR community supports.

8.2 Related to “Lessons Learned” from Current Outreach

In current outreach efforts discussed in the “APEC Survey to Develop a Strategic Education Model for SCATR,” several observations were made regarding the most effective pedagogical means for performing training programs. These observations shed light on optimal strategies for structuring training programs and thus led to the two conclusions – (1) that SCATR education must be implemented in a contextually relevant manner and (2) it must utilize pertinent pedagogical practices. More specifically, SCATR education must take into account the following strategies.

First, organizations wishing to carry out training programs domestically or internationally must implement methods to proactively evaluate the needs of their potential audience. In the case of both international and domestic training, formulating pre-training surveys and requesting the audience to provide “measures of success” for the training programs must be considered. When performing international training, organizations must perform the necessary research to become informed of the host economy’s political and cultural context as well as of relevant terminology in the host economy’s primary language and key information concerning its standardization system.

In addition, respondents to the survey referenced several ideal practices in pedagogy for consideration. SCATR education outreach must promote a series of general “best practices” for conducting SCATR training as they are applicable to a economy’s political and cultural context. For instance, SCATR training must increasingly teach the subjects of standards, conformity assessment, and technical regulations in unison where training has traditionally focused on a single topic at a time. In some economies, it is appropriate to assert that SCATR training must consider incorporating more opportunities for team teaching and active participation in exercises and more real-life examples of SCATR development and implementation as well as soliciting more post-training feedback from participants.

8.3 Related to Vision for the Future

This report has laid out several objectives for the professional communities that directly interact with and/or influence the standards community, including the greater APEC community, as well as the business, regulatory and legislative, academic, trade policy, and technical and scientific communities. The overarching objectives of engaging these groups as recipients of a greater amount of SCATR training includes the ability to promote more international cooperation among these communities. In order to achieve this first objective, a SCATR education outreach strategy must promote clear internationally defined objectives, such as emphasizing the importance of promoting the goal of “one standard, one test, one acceptance” and developing and using international standards based on the criteria outlined by the World Trade Organization. These concepts should be taken one step further to support the policy of allowing the market determine which source of globally-relevant international standards is appropriate in any given situation. Finally, training programs must educate its participants in the proper and accepted international procedures for addressing SCATR-related enquiries or complaints.

With regards to the APEC community, the principle objective of SCATR training programs is to increase the effectiveness of addressing related issues among APEC members. Therefore, training must target relevant APEC actors involved in SCATR-related dialogues in order for them to speak effectively about these subjects. Additionally, as is necessary in the international SCATR landscape described above, training must also focus on educating the greater APEC community in the

procedures for submitting regional enquiries and complaints and highlight the role of APEC's Sub-Committee on Standards and Conformance (SCSC) as the principle resource and point of contact for such issues. In turn, the role that APEC Specialist Regional Bodies play in advising the SCSC on SCATR-related matters must be recognized as well. (The APEC SRBs are: the Pacific Area Standards Congress (PASC), the Pacific Accreditation Cooperation (PAC), the Asia Pacific Laboratory Accreditation Cooperation (APLAC), the Asia Pacific Legal Metrology Forum (APLMF), and the Asia Pacific Metrology Programme (APMP))

The primary objective defined for engaging the business community in SCATR training initiatives was identified as increasing businesses' investment and participation in SCATR-related activities, such as standards development. Therefore, an outreach strategy must prioritize communicating to the principle decision makers within the business community (C-level executives - Chief Executive Officer, Chief Operating Officer, Chief Financial Officer, Chief Information Officer, etc.) of how SCATR affects their business operations and, more specifically, their bottom line. In conjunction, such a strategy must also arm working staff with the arguments necessary to promote participation in SCATR activities internally.

Within the regulatory and legislative communities, the SCATR education outreach strategy will strive to promote good regulatory practices including the implementation of transparent standards development processes and voluntary mechanisms, the development of effective enforcement mechanisms, and creating a business culture that instinctively complies with technical regulations. In order to do so, SCATR education strategies must increasingly promote SCATR training programs that inform training participants of:

- (1) how to assist governments to develop regulations in a transparent context;
- (2) what voluntary mechanisms are, how they are applied, and in which contexts they are appropriate;
- (3) what enforcement methods are used, such as conformity assessment methods, and how they can be applied; and
- (4) how effective enforcement can build a compliance culture.

Given the special focus that outreach efforts would concentrate on the academic community and this group's tendency to isolate itself from practitioners, objectives for this group centered on building a more solid link between standards professionals and academics, including university professors and think tank researchers. In order to reach this goal, a SCATR education outreach strategy should begin by building effective professional networks that will promote interaction between these two groups. From there, standards professionals should remain informed of academic papers in progress and must engage as often as possible with academic professionals in order to provide them with current, accurate information pertaining to their study. In addition, practitioners should be aware of capacity building and infrastructure resources available from the APEC's Sub-Committee on Standards and Conformance and Specialist Regional Bodies to address SCATR-related issues.

As trade policy professionals often prioritize domestic markets, it is hoped that this community in particular will increasingly make efforts to improve international cooperation by defending international agreements made in the interest of all agreeing parties. To do so, SCATR education outreach to this community must:

- (1) address how upholding international agreements is beneficial to the signatories' respective markets,

- (2) clearly outline what is “illegal” in the international trade context and what is simply “trade disruptive”, and
- (3) encourage the promotion of WTO practices within foreign ministries.

Finally, to increase the participation of the scientific and technical communities in the standards developing process and harness their influence within their respective organizations, SCATR outreach to these professionals will require arming them with the skills needed to address relevant decision makers. This community must primarily learn how to package their extensive knowledge into a clear, concise message that resonates with individuals that may not have any knowledge of or interest in standards.

ANNEX A

Institutions that contributed through APEC member economies to the “APEC Survey to develop a Strategic Education Model for Standards and Conformance”

Australia

Standards Australia

Brunei Darussalam

Construction Planning and Research Unit, Ministry of Development

Chile

Ministry of Economy, Foreign Trade Department

China

Standardization Administration of China

China Jiliang University

Huazhong University of Science and Technology

Nanjing University of Agriculture

Zhongnan University of Economics and Law

Hong Kong

Innovation and Technology Committee

Product Standards Information Bureau

Hong Kong Institute of Engineers

Hong Kong Productivity Council

Indonesia

Badan Standardisasi Nasional

Korea

Korean Standards Association

Telecommunications Technology Association

Malaysia

Department of Standards Malaysia

New Zealand

Standards New Zealand

Singapore

SPRING Singapore

Chinese Taipei

Advance Data Technology, Ltd.

Chunghwa Telecom Co.

Electronics Testing Center

National Information Infrastructure Enterprise Promotion Association

Taiwan Accreditation Foundation

Thailand

Thai Industrial Standards Institute

United States

American National Standards Institute

American Association for Laboratory Accreditation

ASTM International

Catholic University

Faulkner University

Intellectual Property Shield

Underwriters' Laboratories

Viet Nam

Directorate for Standards and Quality

ANNEX B

Complete Case Study: Efforts to Raise Awareness of UL Standards and Conformance Solutions

Underwriters' Laboratory (UL) has focused on raising awareness of their solutions among public policy officials, as well as among the general public, by conducting broad outreach efforts that focus on connecting standards and conformity assessment to real life. Efforts have been maximized through strategic partnerships with organizations that hold similar objectives, as well as with organizations such as Disney that can lend public recognition and credibility to its messages. While UL has invested significantly in programs that advance safety around the world, the following case study example focuses on the organization's efforts in the United States.

Campus Fire Safety Outreach:

UL has developed a strong program for outreach on fire safety to college campuses. In the United States, there are national laws requiring fire safety measures for facilities that host children and the elderly. However, for typical adult facilities such as college dormitories, there are generally no legal requirements for sprinklers, fire extinguishers, and similar fire safety measures.

UL, in cooperation with the Center for Campus Fire Safety, has performed outreach and training to college campuses around the United States. The program trains students how to prevent fires and how to react if there is a fire, provides a fire fighting demonstration, and shows students a "burn test" to demonstrate to students what a dorm room would look like if it caught fire and how quickly fire can spread in a dorm setting. UL has encouraged university students to advocate for campus policies, as well as federal and state laws, that would require universities to make information on their fire safety infrastructure available to the public, and to outfit dorms and classrooms with sprinklers and fire extinguishers.

Behavioral Outreach and Education:

Through its years of experience in training, Underwriters Laboratories (UL) has learned that efforts to address the safety of products are ineffective unless the product is used correctly by the end consumer. The organization has invested in public outreach and awareness campaigns to help consumers understand the benefits of third party certification, including what makes a certified product safe and why it is important to use the product correctly. This outreach includes providing the media with statistics and information on products with high instances of misuse.

For example, UL working in partnership with the National Association of State Fire Marshals, the U.S. Consumer Product Safety Commission, and the Association of Home Appliance Manufacturers, has supported a major initiative to prevent fires arising from cooking stove misuse, a leading consumer product hazard leading to deaths and injuries in the U.S. Efforts in this area have included targeted door-to-door outreach to the population segment with the highest instances of cooking fires, developing educational videos on proper stove use and making these available to media and retailers. UL also works closely with public television stations in the United States to advance consumer education on the dangers of product misuse. Similar initiatives also exist for other products where proper use is critical to safety, such as carbon monoxide detectors and power generators.

Outreach to Public Policy Officials

In cooperation with regulators, UL focuses on making standards seem more realistic, promoting a better understanding of the technical side of public policy decisions involving standards and conformity assessment solutions. Government relations staff make a strong effort to ensure that understanding of the organization's work is tangible, actually bringing electrical products to meetings with government representatives. Public policy outreach has aimed to raise awareness of technical issues while emphasizing the value of standards and certification to society. UL has advocated initiatives for the public good such as increased investment in training for fire and electrical safety professionals and legislation to ensure that college campuses are adequately protected from fire risk.

Outreach to public policy officials has also placed a strong focus on prevention of counterfeit certification marks. Recognizing that conformity assessment is something that U.S. consumers generally take for granted and that it is often automatically assumed that the products being sold on the market are safe, it is crucial to raise awareness of the safety risks associated with counterfeit marks and to engage in public-private partnerships, ensuring that counterfeit products are not able to reach store shelves.

UL has initiated programs with various U.S. government agencies, including U.S. Customs and Border Control and the Department of Justice, to make front-line officials aware of the risks of counterfeit marks, to help them identify real and fake marks, and to inform them of who to contact if they encounter suspicious marks.

Outreach to Children

UL has established a strategic relationship with Disney in order to reach a broader audience and ensure that their messages are well received. Disney's Epcot Center in Florida includes a "Test the Limits Lab" exhibit co-branded by the organization. In this exhibit, children and adults can learn about lab testing and engage in simulated experiments to evaluate the strength and properties of consumer products. One of the most popular "experiments" allows tourists to throw a lead ball at a television set to see the effects.

Through its relationship with Disney, UL has also developed a series of videos for young children featuring popular Disney characters, teaching basic electrical safety principles. These videos are distributed to elementary school teachers with a teachers' guide. Finally, the organization is featured in a regular segment on "Bill Nye the Science Guy", a popular Disney television program for older children. The segment introduces lab testing techniques in a fun and entertaining format.

The organization has also instituted a successful "Safety Ambassador Program" in which staff members rotate teaching electrical safety classes in elementary schools. UL has a professional "Train the Teachers" program to teach technical staff the best techniques to reach younger students. As part of this program, students are also able to visit UL on field trips to see "real life" examples of labs and other facilities.

ANNEX C

Example of Public Relations-based Standards Education Outreach

White paper on the Importance of Standards, Conformity Assessment and Technical Regulations (SCATR)

The effects of standards in international trade have become more discernable as unilateral and multilateral trade liberalization has brought down tariffs in many parts of the world⁹. The WTO officially defines the word “standard” as a “document that provides, for common and repeated use, rules, guidelines or characteristics for products or related processes and production methods, *with which compliance is not mandatory*. It may also include or deal exclusively with terminology, symbols, packaging, marking or labelling requirements as they apply to a product, process or production method.”

To remove ambiguity while at the same time addressing related concerns, it is often convenient to identify these three collectively by the acronym SCATR. When used appropriately, SCATR can protect the environment, health and safety (EHS) and also facilitate trade. However, when developed or applied inappropriately (for example as an overtly trade-restrictive or protectionist measure), SCATR can pose obstacles to trade and become non-tariff barriers (NTBs), or more specifically, behind the border issues or in-country barriers (ICBs)¹⁰.

Private Sector Standards (the “S” in SCATR)

Private sector standards apply to most goods and services for purposes such as: product quality, raw material specification, component interoperability, test procedures, containerization for storage and shipping, workforce qualification, measures for business profitability and economic performance, product safety (fire, mechanical, electrical, etc.), food safety and security, building and electrical codes¹¹, protection of the environment, health and safety and many others. As the aerospace industry likes to say “An airplane is 20,000 standards flying in formation.”

In modern economics, the vast majority of rules which apply to businesses and consumers around the world are defined in private-sector standards. These standards are:

- Generally developed in private-public sector committees composed of technical experts from all stakeholder groups – private and public sectors;
- Useful and effective because they are updated on an ongoing basis at pace with the latest technologies; and
- Strongest and most effective when standards users (industry, regulators, etc.) lead their development and are able to choose the standards that best suit their individual needs. Governments should not arbitrarily influence the mechanisms by which standards are developed or selected.

⁹ WTO World Trade Report 2005, p.29

¹⁰ The U.S. Chamber of Commerce now uses the term In-Country Barrier (ICB) as part of their Global Regulatory Cooperation Project.

¹¹ Codes are examples of private sector standards (model codes) adopted by reference into mandatory local regulations.

The Value of Standards to Businesses and to Regulators

Private sector standards complement, and often define, the specific criteria of mandatory technical regulations at the international, national, state, and local levels around the world. In the U.S., for example, federal law and policy calls for the incorporation of private-sector standards into regulations wherever possible¹². As of 2007, over 6,500 federal regulations referenced voluntary standards. This practice is the most effective mechanism known to facilitate trade through cross-border compatibility of rules while at the same time, effectively protecting EHS. Incorporation of standards into regulations helps governments to achieve their objectives in a more cost-effective and efficient manner. This practice eliminates the administrative costs of standards development for regulators and reduces the cost of regulatory enforcement as regulations increasingly refer to standards already used by the private sector. This practice also brings significant benefit to industry, allowing companies flexibility to find solutions that best suit their needs and that adjust quickly to advances in technology. The dynamism of the U.S. economy is owed in part to an innovation-friendly regulatory framework supported by the policies above.

Current SCATR Challenges facing International Businesses

Regionalism vs. Internationalism

The view outside of Europe, and exemplified the APEC approach, is to not develop regional standards or conformance schemes but rather to support regional efforts to increase the direct participation of economies in international standards and conformity assessment activities. This approach places priority on supporting an open global market vs. a common, inwardly-focused, regional market; deregulation and bottom-up incremental alignment of SCATR vs. superficial unanimity and rigid top-down harmonization. Efforts which prioritize the establishment of regional SCATR over cooperation efforts (such as APEC), while not TBTs per se, create a divergent global SCATR framework which is neither efficient, conducive to global trade, nor aligned with the interests of the WTO and its members.

Inadequate Transparency

Global companies encounter significant difficulty learning about current and proposed standards, technical regulations and conformity assessment requirements for their target export markets. In some cases, companies do not learn of new or amended technical regulations until their shipments are held at customs. Under these circumstances, companies are unable to either anticipate changes or influence the development of standards and technical regulations. These issues create a particular burden to small and medium-sized enterprises (SMEs).

Inadequate Participation in International Standards

Without strong participation in the development of international standards, countries are tempted to create “home-grown” standards, and/or do not have the technical expertise to apply standards correctly in technical requirements. This creates significant burdens to international commerce, forcing companies to use different technical specifications in different markets. Concern also exists that among those

¹² [National Technology Transfer and Advancement Act \(Public Law 104-113\)](#) and [OMB Circular A-119](#)

countries that do participate in international activities, many delegate bureaucratic administrators, rather industry experts, to participate. This leads to politically-motivated developments that are not technically-based and do not meet the needs of global companies. Finally, concern exists that many countries have a limited view of international standards, overlooking many of the fora used by APEC and global industry.

Intellectual Property and Standardization Convergence

Concerns are mounting as some governments develop policies regarding the treatment of IPR and patents in standards. While most Asia-Pacific industry generally prefers to have such policies determined by individual SDOs, concerns exist that converging government policies could hinder corporate ability to protect patented technology in the standardization process and, ultimately, to innovate and compete in foreign markets.

Redundant and Duplicative Testing:

Many foreign markets require that certification and testing for regulatory compliance be performed in-country by domestic organizations. These requirements not only create unnecessary burdens for a broad scope of APEC exporters, but also deny market access to a key segment of the domestic market for accredited international testing and certification services.

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