XIX IMEKO World Congress
Fundamental and Applied Metrology
September 6-11, 2009, Lisbon, Portugal

THE ROLE OF METROLOGY COMMUNITIES UNDER THE WTO SYSTEM: MEASUREMENT SCIENCE AND CONFORMITY ASSESSMENT PROCEDURES

Jookeun Park [1], *Gun Woong Bahng* [2]

[1] Project Coordinator, National Centre for Standard Reference Data(NCSRD), Korea Research Institute of Standards and Science(KRISS), Daejeon, Rep. of Korea, jkpark@kriss.re.kr
[2] Director, NCSRD, KRISS, Daejeon, Rep. of Korea, gwbahng@kriss.re.kr

Abstract – Technical barrier to trade (TBT) has become one of the significant non-tariff measures with the advent of the WTO system in 1995. The key issue in TBT is that technical regulations, standards, and conformity assessment should not be used as barriers to trade. Regarding conformity assessment, the WTO/TBT Agreement recommends members to enter into negotiations for the mutual recognition of results of each other's conformity assessment, as well as to permit participation of conformity assessment bodies located in other members. In this paper, it will be reviewed why the role of measurement science is important in terms of international effort to eliminate technical barriers to trade particularly in the area of conformity assessment.

Keywords: TBT, conformity assessment, measurement science

1. INTRODUCTION

The primary objective of the TBT Agreement, which is one of the 13 multilateral agreements governing international trade in goods, is to ensure that technical regulations, standards, and conformity assessment procedures[1] do not create unnecessary obstacles to trade. The TBT Agreement suggests that 'harmonization' and 'transparency' should be based to avoid those three(3) factors being unnecessary obstacles to trade although no country should be prevented from taking measures appropriate for human, animal or plant life or health and for the protection of environment. Especially regarding conformity assessment procedures, it recommends member countries to recognize testing, inspection and calibration results each other. In other words, whenever possible, results of conformity assessment procedures in other members are to be accepted even when those procedures differ from their own. But in this case, it is a prerequisite to ensure that relevant conformity assessment bodies (CABs) have adequate and enduring technical competence for the continued reliability of their conformity assessment results. Metrology communities play an important role in CABs' obtaining technical competence in their activities.

This study aims to provide the rationale for the role of metrology communities in the WTO's efforts to realize free trade system, particularly with regard to the conformity assessment.

2. WTO/TBT AGREEMENT AND CONFORMITY ASSESSMENT

2.1. TBT Agreement and the Matters to be Considered

The WTO was created as a result of the Uruguay Round which lasted from 1986 to 1994 under the GATT System. While the GATT had mainly treated tariff measures of trade in goods, the WTO and its agreements covered trade in services, intellectual properties, as well as non-tariff measures of trade in goods.

The emergence of the WTO means that the world trade in goods is laid under the 16 multilateral agreements governing the international trade order.

Table 1. WTO multilateral agreements on trade in goods

No	Agreements
1	General Agreement on Tariffs and Trade (GATT) 1994
2	Agreement on Agriculture
3	Agreement on the Application of Sanitary and Phytosanitary Measures
4	Agreement on Textiles and Clothing
5	Agreement on Technical Barriers to Trade
6	Agreement on Trade-Related Investment Measures
7	Agreement on Implementation of Article VI of the GATT 1994
8	Agreement on Implementation of Article VII of the GATT 1994
9	Agreement on Preshipment Inspection
10	Agreement on Rules of Origin
11	Agreement on Import Licensing Procedures

[1] For the purpose of this paper, the conformity assessment procedures are *"any procedures used, directly or indirectly, to determine that relevant requirements in technical regulations or standards are fulfilled"* as defined in the TBT Agreement. In the mean time, the technical regulation is the *"document which lays down product characteristics or their related process and production methods with which compliance is mandatory"* while the standard is not mandatory in its compliance.

12	Agreement on Subsidies and Countervailing Measures
13	Agreement on Safeguards

As one of the important agreements concerning non-tariff barriers, the TBT Agreement covers the matters of technical barriers to trade caused by the different technical regulations, standards and conformity assessment procedures that each member country adopts, maintains and applies. In a sense, it is true that every country has the right to establish its own technical regulations and standards since they are derived, to a certain extent, from different custom, tradition, history, geographical conditions, etc. However, it may not be ignored that the variety of technical regulations and standards acts as barriers to trade. Moreover, they can be used as an excuse for protectionism if they are set arbitrarily.

Although the purpose of the TBT Agreement is to ensure that technical regulations, standards, or conformity assessment procedures do not create unnecessary obstacles to trade, it recognizes a country's right to adopt its own technical regulations which are appropriate for national security requirements, or for the protection of human, animal or plant life or health, of the environment.[2] However, controversy still exists regarding what measures are considered to be the ones for the 'legitimate objectives'. In order to evaluate the legitimacy of technical regulations, what the Agreement requires is 'available scientific and technical information' or 'related processing technology'.

In addition, 'harmonization' and 'transparency' are significant methodological approach to put the Agreement into practice. Under the principle of harmonization, all the member countries are requested to use, if they exist, relevant international standards when establishing technical regulations and standards. However, members take the responsibility of the 'transparency' when relevant international standard do not exist, or the technical content of proposed technical regulations and standards are not in accordance with the technical content of relevant international standards. That is, members have to provide particulars or copies of the proposed technical regulations and standards to other members through the WTO Secretariat. These concepts of (i) 'available scientific and technical information or related processing technology;' (ii) 'harmonization' and (iii) 'transparency' give us implications about the roles of metrology under the WTO system.

2.2. Conformity Assessment Procedures

The concepts are applied to conformity assessment procedures as well. For example, members have to use relevant guides or recommendations issued by international standardizing bodies as a basis for their conformity assessment procedures. They also have the obligation of notification to other members under the above mentioned conditions.

Conformity assessment procedures are directly concerned with technical activities which include procedures for sampling, testing and inspection, calibration, evaluation, certification, accreditation as well as their combination. It goes without saying that most of these procedures can act as parts of 'available scientific and technical information/ related processing technology'.

In order to avoid a possibility of such procedures acting as technical barriers, the Agreement recommends that members should accept, whenever possible, the results of conformity assessment procedures in other members, even when those procedures differ from their own, provided they are satisfied that those procedures offer an assurance of conformity with applicable regulations or standards equivalent to their own procedures. Moreover, members are encouraged to enter into negotiations for the conclusion of agreements for the mutual recognition of results of each other's conformity assessment procedures.

The point in this matter, however, is that the confirmation of the conformity assessment bodies (CABs)' technical competence should be preceded before the recognition of other members' results of conformity assessment. That is, relevant CABs have to prove that they have adequate and enduring technical capabilities in performing inspection, testing, calibration, accreditation, etc.

In this case, relevant guides or recommendations issued by international standardizing bodies can be taken into account as an indication of adequate technical competence of CABs. For example, testing and calibration laboratories should operate their quality system for their testing and calibration activities based on the ISO/IEC 17025 regarding 'general requirements for the competence of testing and calibration laboratories'.

Likewise, ISO/IEC 17011 sets out the general requirements for accreditation bodies accrediting conformity assessment bodies. The purpose of the guide is for the accreditation or the body operating the accreditation system to be recognized at national or international level as competent and reliable.

2.3. National Standards Infrastructure

A national standards infrastructure consists of technical regulations and standards; conformity assessment procedures; and measurement science. Although each of these has different level of applications, they are closely interacted under the national standards infrastructure.

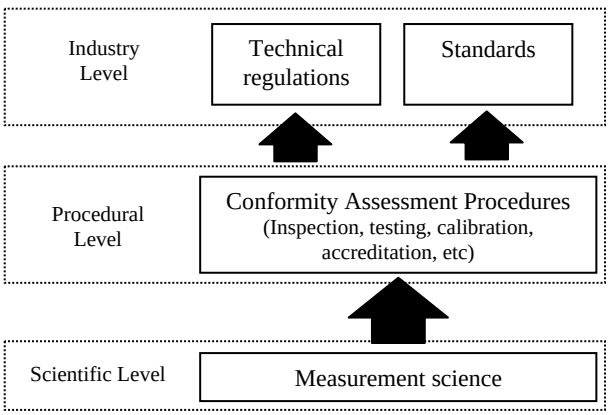

Fig. 1. National standards infrastructure

[2] This is what is called 'legitimate objectives'. The Agreement states that "*technical regulations shall not be more trade-restrictive than necessary to fulfil a legitimate objective.*"

3. THE ROLES OF METROLOGY COMMUNITIES IN INTERNATIONAL TRADE

The industrial and regulatory level of activities in international trade depends critically on the reliability of conformity assessment results of CABs. In the meantime, technical capabilities of CABs can be scientifically guaranteed by the CIPM MRA activities in metrology communities.

The following figures show how the constituents of the national standards infrastructure interact with each other in each level relating to international trade.

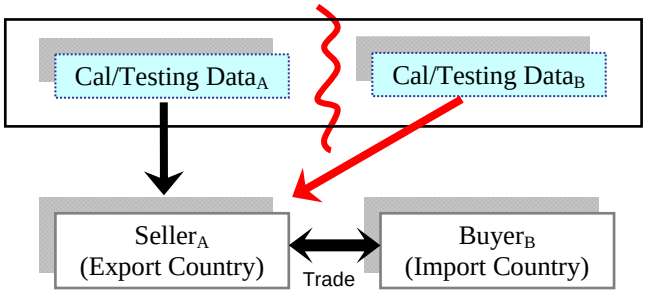

Fig. 2. Interaction between trade and conformity assessment procedure in industrial level

If the buyer (import country) demands testing or calibration data of a CAB in its own country for imported goods, then the seller (export country) should spend more money and time than expected to get testing or calibration certificates from the buyer's country. In this case, the requirements by the seller for any certificates act as technical barriers to trade. This problem might be resolved if both country mutually recognize the results of conformity assessment procedures.

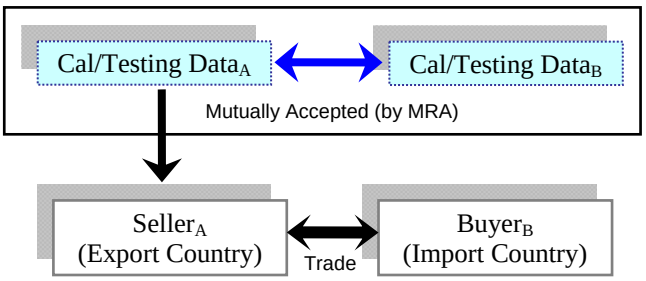

Fig. 3. Interaction between trade and conformity assessment procedure in procedural level

Before mutual recognition between the seller and the buyer of the results of conformity assessment procedures, they should check each other if the CABs in both countries have and maintain adequate technical capabilities, as is stated in the TBT Agreement.

But there is an important matter to be considered in the procedural level. How they can assure that each other's CABs have technical capabilities? This is the reason that the national accreditation bodies (NABs) signed the International Laboratory Accreditation Cooperation (ILAC) MRA in 2001, as well as the national metrology institutes (NMIs) signed the CIPM MRA in 1999. Particularly with the signing of the CIPM MRA, NMIs have been performing international key comparison (KC).

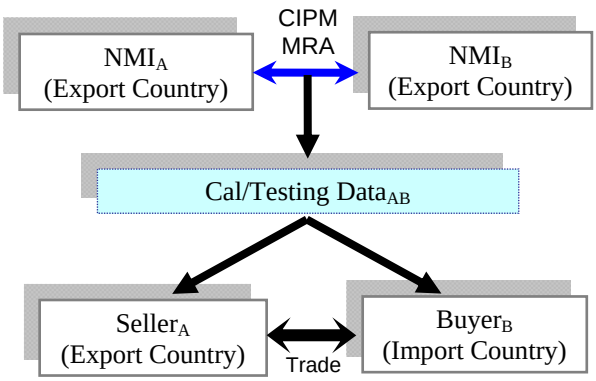

Fig. 4. Interaction between conformity assessment procedure and measurement science in scientific level

The CIPM MRA clearly mentions that it has been drawn up to establish the degree of equivalence of national measurement standards maintained by NMIs; to provide for the mutual recognition of calibration and measurement certificates issued by NMIs; thereby to provide governments and other parties with a secure technical foundation for wider agreements related to international trade, commerce and regulatory affairs.

In fact, national measurement standards supporting the calibration and measurement capabilities (CMCs) from an NMI are either themselves primary realizations of the SI or are traceable to primary realizations of the SI at other NMIs through the framework of the CIPM MRA. Other accreditation laboratories, covered by the ILAC Arrangement, also provide a recognized route to traceability to the SI through its realizations at NMIs which are signatories to the CIPM MRA, reflecting the complementary roles of both the CIPM MRA and the ILAC Arrangement.

4. CASES OF KOREA

4.1. Daewoo Shipbuilding and Marine Engineering (DSME)[3]

Daewoo Shipbuilding & Marine Engineering Co. Ltd (DSME) made a successful bid to build an offshore semi-submersible rig facility for British Petroleum (BP) in 2001. It was required by BP that DSME prove the competence of its calibration laboratory traceable to NIST and its operation to the ISO/IEC 17025.

As DSME was accredited by Korea Laboratory Accreditation Scheme (KOLAS) which is a member of Asia Pacific Laboratory Accreditation Cooperation (APLAC) and ILAC, NIST confirmed that traceability to the KRISS, NMI of Korea is equivalent to traceability to NIST via the CIPM MRA. As a result, BP accepted accreditation by KOLAS and calibration certificates issued by KRISS.

[3] http://kcdb.bipm.org/NL/06/DSME_case_study.pdf

DSME estimated that if their calibration reports had not been accepted, an additional US$10 million would have been budgeted for the project due to technical barriers to trade, reducing its international competitiveness.

4.2. Pohang Iron and Steel Company

In 2004, a Mexican automobile parts manufacturer was interested in purchasing steel of Pohang Iron and Steel Company (POSCO) which is the largest steel manufacturer in Korea. They demanded the proof of the reliability of POSCO steel. Again in 2004, an Indian buyer of POSCO steel required the steel to have certification from the Bureau of Indian Standards (BIS).

In both cases, they requested the proof the reliability of POSCO steel. For example, the Indian buyer demanded the certification from BIS. But the steel tested by the POSCO laboratory didn't have to be retested in India since it was accredited by KOLAS which is a signatory to the ILAC MRA with traceability to KRISS. The Mexican buyer also accepted the test report by the POSCO laboratory.

4.3. Samsung Heavy Industry[4]

Samsung Heavy Industry (SHI) received an order of offshore platforms for oil and gas developments from Sakhalin Energy Investment Company Ltd (SEIC) as part of Sakhalin II project, Russia in 2003. All the measuring instruments of more than 10,000 being installed to the platforms were asked to be traceable to national measurement standards of Russian Federation according to its relevant law.

As KRISS and D. I. Mendeleyev Institute for Metrology (VNIIMS), one of the NMIs in Russia, were both signatories to the CIPM MRA, SEIC approved all the measuring instruments traceable to KRISS as the ones that are traceable to VNIIMS.

5. CONCLUSIONS

The US Department of Commerce estimates that standards issues impact 80 % of world commodity trade. Reflecting the importance of standards in international trade in goods, the CIPM MRA was signed between the NMIs in 1999.

The CIPM developed technical tools of key comparison (KC) and calibration and measurement capability (CMC) ultimately for providing technical foundation to international trade, commerce and regulatory affairs. As is mentioned in the 'Joint Statement by the CIPM and the ILAC', the dissemination of national standards and measurement capability from the NMI (in scientific level) to accredited laboratories (in procedural level) is essential in order to achieve user confidence (in industry level).

In fact, all these activities interactively take place in a national standards infrastructure which provides technical foundation to international trade and regulatory affairs. That is, they can serve as technical tool for 'available scientific information', 'harmonization' and 'transparency'.

From this point of view, the role of metrology communities is significant in removing technical barriers to trade and closely related to international trade system under WTO.

REFERENCES

[1] ILAC/UNIDO, *Laboratory accreditation in developing economies*, Working Paper No. 2, 2003.

[2] H. G. Semerjian and R. L. Watters, "Impact of measurement and standards infrastructure on the national economy and international trade", *Measurement*, vol. 27, pp. 179-196, 2000.

[3] C. Sanetra and R. M. Marban, *The answer to the global quality challenge: A national quality infrastructure*, PTB, OAS and SIM, 2007.

[4] US Department of Commerce, *Standard & competitiveness: coordinating for results*, 2004

[5] WTO, *Understanding the WTO*, 3rd edition, WTO Information and Media Relations Division, February 2007.

[4] http://kcdb.bipm.org/NL/10/KRISS-VNIIMS_CIPM_MRA_CaseStudy.pdf