

The Trend of International Standardization of Social Infrastructure

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In recent years, the international standardization of social infrastructure is receiving considerable attention. Since social infrastructure comprises a combination of different products, the areas subject to standardization are diverse, from individual product technologies to compliance and the safety of entire systems. The Technical Barriers to Trade Agreement (TBTA) and Government Procurement Agreement (GPA) of the World Trade Organization (WTO) oblige their signatories to comply with international standards for cross-border transactions of social infrastructure products. Thus it is essential to understand the trend of international standardization of social infrastructure exports.

1. Standardization of Social Infrastructure

1.1 An Example of Standardization

Standardization of social infrastructure involves not only “technologies and specifications of products,” but also “system management and operation” and “conformity assessment.” In a water project, for example, standards to follow include “system management and operation,” such as business activities and services, and “conformity assessment,” such as water quality and flow rates, in addition to “technologies and specifications of products,” such as dimensions and shapes of filtration membranes (Table 1).

Table 1: Standards for Water (ISO¹ and other)

Standard		Examples
Technologies and Specifications of Products	Filtration membranes	• Dimensions and shapes
	Non-open-cut Water Pipes	• Product design and implementation
System Management and Operation	Business Activities and Services	• Assessment and improvement of services • Sewage project management
	Security	• Emergency response • Management for continuity
Conformity Assessment	Water Quality	• Toxicity measurement method
	Flow Rate Measurement	• Meters for cold drinking water and hot water • River flow velocity and volume
Others	Definition	• Terms and symbols

Prepared by Hitachi Research Institute based on data from released materials and interviews

1.2 The Standardization Strategy for Social Infrastructure is Different from that for Mass-produced Goods

As described above, social infrastructure is a system with a combination of many products. For this reason, the objectives and items for standardization are different from those for mass-produced goods, such as consumer appliances (Table 2). Therefore, formulating a strategy for social infrastructure standardization requires different perspectives, such as: 1) taking into account the entire system, which comprises a wide range of products; 2) establishing a system structure that includes products manufactured by competitors; 3) implementing post-completion certification to ensure safety; 4) conducting coordination with stakeholders, such as local governments, suppliers and construction workers; and 5) optimizing the revenue model to take into account system operation, as well as system sales.

Table 2: Comparison between the Standardization of Consumer Appliances and of Social Infrastructure

Item	Appliances	Social Infrastructure
Objectives	• Improved compatibility and operability with standardized specifications	• Quality improvement • Safety improvement • Reduction of government procurement costs
Areas Subject to Standardization	• Mainly products and individual technologies	• Products and individual technologies • System management and operation • Conformity assessment
Timing of Certification	• To be certified before shipment	• Each product to be certified before shipment, and systems to be certified upon installation as well as completion
Standardization Organizations	• Blu-ray Disc Association (BDA) • Third Generation Partnership Project (3GPP)	• International Atomic Energy Agency (IAEA) • Comité Européen de Normalisation (CEN)

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2. The Importance of Establishing a Strategy for Social Infrastructure Standardization

2.1 Standardization Driven by the WTO

Based on the TBTA and GPA, the WTO is encouraging each member country to adopt international standards. In international trade, the TBTA obliges countries to let international standards take precedence over domestic ones. In addition, government entities and public utilities such as electricity suppliers and railways are bound under the GPA to place priority on internationally standardized products in their procurements. Although the number of GPA signatories is only 42 countries and regions, as it is a voluntary agreement, during the export of social infrastructure products or systems, it is important to check whether the destination country is a GPA member.

Table 3 : WTO Agreements on International Standardization

Agreement	Description
Agreement on Technical Barriers to Trade (TBTA): 157 countries and regions are signatories (as of October 2012)	<ul style="list-style-type: none"> The TBTA aims to eliminate as many differences in standards, which it considers to be barriers, as possible, to promote international trade. Under the TBTA, it is obligatory for international standards to take precedence over domestic ones.
Agreement on Government Procurement (GPA) 42 countries and regions are signatories (as of October 2012)	<ul style="list-style-type: none"> The GPA obliges government entities (national and local governments) and public utilities (such as electricity suppliers and railways) to conform to international standards in their procurement of products and services (including construction work). The GPA aims to ensure the quality of imported and exported products and promote price competition

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2.2 Standardization of Assessment Guidelines for Products and Systems

At the same time, more effort is being made to standardize guidelines to assess products and systems. Specifically, these guidelines cover areas such as environmental design, power saving and security.

Because the specifications in these areas are difficult to assess before purchase, standardization is of great significance to purchasers. Thus, it is important to adopt standardized assessment guidelines to show the advantages of products and systems.

2.3 Standard Adoption Affects Business and Cost

If a country's standards are not recognized as international, its infrastructure-related companies will need to bear a significant amount of additional costs, as they will be required to conform to standards adopted in other countries. For infrastructure-related companies, it is essential to understand the trend of international standards and take appropriate action.

Table 4: Cases of International Standardization Issues

Product	Description	Results
Taiwan High Speed Rail	<ul style="list-style-type: none"> A consultancy in Europe proposed railway specifications which conformed to the EN² standards. A Japanese company won the tender in late 2000, but the customer demanded that the company comply with the EN standards. 	<ul style="list-style-type: none"> It took time for the Japanese company that won the deal to adjust the high speed railway system in Japan to the EN standards, causing delays to the development process of the project.
Suica (Non-contact IC "smart" card)	<ul style="list-style-type: none"> The IEC³ recognizes two formats of Motorola and Philips Semiconductor as international standards for non-contact IC cards. In June 2000, JR East announced a procurement requirement that the Japanese format must be adopted for the IC-card entrance gate system. Motorola objected to the requirement, claiming that it violated the WTO government procurement rules. 	<ul style="list-style-type: none"> In 2004, the IC card specifications of Japan became the IEC standard as a proximity card, and not a non-contact IC card. JR East adopted the Japanese IC card specifications by changing its requirement to a proximity card format that complies with international standards.

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3. Standardization Strategy in Japan

Due to its geographical location, Europe has been active for many years in efforts for the implementation of standardization. Currently, the European Union (EU) has significant influence over international standardization, such as through the IEC/ISO, as they adopt a “one country, one vote” majority voting system.

Meanwhile, Japan has been promoting measures, with joint efforts by its public and private sectors, to 1) enhance cooperation and coordination among Asian countries; and 2) secure and develop talent with negotiating skills and political strength who are capable of decision-making from a business viewpoint.

- 1: International Organization for Standardization.
- 2: European Norm.
- 3: International Electrotechnical Commission.