National Strategies for International Standardization in Japan
And the Roles of Japanese Standards Association

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1. History of industrial standardization

Industrial standardization in Japan started with the establishment of procurement standards by the army and the navy, standards for procuring parts and components by government offices, and standard specifications for steel pipes for the national water supply.

Systematic industrial standardization began in 1921, when a study committee was formed for the standardization and unification of industrial commodities. The committee established 520 "Japanese standards" (the old JES) by April, 1921. They also established 931 "Tentative Japanese standards" (Rin-JES, or tentative JES) toward the end of the World War primarily for military-use commodities. During the war, the committee established 660 "Japanese aeronautical standards."

After the war in 1946, the establishment of the Industrial Standards Committee was officially announced. The standards thereafter were referred to as the "Japanese Standards" (or the "new JES") and 2,100 standards were established. In 1949, the Ministry of International Trade and Industry-MITI- (It changed its name to The Ministry of Economic, Trade and Industry-METI- in 2001) enacted the Industrial Standards Law. This law established "the Japanese Industrial Standards Committee" (JISC). In coordination with each Minister in charge, the committee's deliberations led to the establishment of the "Japanese Industrial Standards" (JIS). JIS is established by the government. In most of industrialized countries, national standards are established by the private organizations.

The Japanese Standards Association (JSA) was established in 1945 with the objectives of contribution to technological innovation, improvement of production efficiency and the quality of life through promoting industrial standardization. The JSA has since played a major role in national standardization projects, in cooperation with the JISC, as an organization representing private-sector activities targeted for industrial standardization.

2. Necessity of national standards

(1) Implications of industrial standardization

Industrial standardization implies minimization, simplification, and organization through the standardization of versatile, complex, and disorderly matters and phenomena, to facilitate convenience, efficiency, fairness, progress, safety, and health - as well as environmental protection - in connection with economic and social activities.
Promotion of mutual understanding
This is an activity designed to unify the means of, and to build a common platform for, the mutual communication of requirements, thoughts, opinions, technical data, and other data among the appropriate parties. Terminologies, symbols, methods of drawing, units of measurement, test and evaluation methods, and display of formatted specifications are typical subjects of focus of this activity.

Assurance of interchangeability, and interface compatibility
It is very inconvenient if parts cannot be assembled together or exchanged. Convenient exchangeability of parts, interface standardization between systems, or (more broadly) interchangeability and mutual adaptability in the fields of information technology and factory automation are becoming more and more important.

Versatility compliance
Large-scale production, through the reduction of types and models, will provide great economic benefit, provided that those concerned share unanimous agreement. It will also become important in the future to consider the limitation of standardization in certain areas, to respect the principle of versatility in general.

Clarification of appropriate quality levels
Standards stipulate certain levels of quality for products. Three objectives of standards are (1) to provide quality targets for manufacturers, (2) to provide protection to users and consumers in terms of safety and health, and (3) to protect the public interest, in terms of environmental protection and energy-saving, for example.

Commitment to policy objectives and elimination of trade barriers
Sometimes commitment to policy objectives is considered to be an objective of the standardization, similar to consumer protection, environmental protection, and conservation of energy and resources. In this context, standardization is effected to maintain and develop free trade. It is important for the ISO and the IEC to establish international standards, and to consider issues of compatibility with the internal standards of each country.

(2) Levels of industrial standardization

International standardization
International standards, such as ISO and IEC

Regional standardization
A region comprised of several countries makes its own regional standards, applicable only in the region such as EU.

National standardization
This refers to standards applicable within one national territory.

Group standardization
This refers to standards applicable within a business group, an academic society, or an industry association.

- **Internal standards of a corporation or inter-office standards**
  An internal standard is only applicable within a company, or at a particular factory. There are also government standards, applied to government procurement.

The foregoing standards are all established in association and in accordance with each other. National standards are the most important standards among them. Advanced countries and developing countries alike are seriously working on the establishment of such national standards.

### 3. Outlines of an Industrial Standardization system

**OHP4**

(1) **Current status**

The industrial standardization system of Japan consists of two key operations: one is the establishment of "Japanese Industrial Standards-JIS" under the Industrial Standardization Law; the other is the operation of the "JIS Marking system". Until the end of March, 2001, 9,038 JIS were already established, and the number of factories certified to display the JIS Marking (i.e., factories that are certified as being capable of manufacturing products in conformity with JIS standards) is approximately 14,000 in Japan, and approximately 400 overseas. The roles of the system are to encourage businesses to introduce quality management activities, and to develop them to higher levels.

(2) **Revisions of the Industrial Standardization Law**

In accordance with the recent development of global economic activities, the WTO/TBT agreement (an agreement regarding the abolition of technical barriers to trade) was concluded. In compliance with the agreement, and in order to make our industrial standardization system more attractive internationally, the Japanese government made revisions to the Industrial Standardization Law (passed in March 1997, made effective as of September 1997). A summary of the revisions are as follows.

- Regarding the JIS marking system, the revised Law allowed certification of JIS Marking by private organizations designated by METI (the Ministry of Economic, Trade and Industry) within and outside Japan, in addition to certification by the Minister himself, reflecting the trend in international standards.

- For products not subject to JIS marking, certificates proving conformance to JIS standards, as determined through testing, can be issued by designated private testing organizations both within and outside of Japan, based on international standards.

- In the past, the government worked out most of the draft JIS standards. Then the system was revised to allow private sector groups to propose draft JIS standards, and to encourage the active involvement of such groups.

(3) **Scope and Classification of JIS standards**

**OHP6**
JIS standards are standards for mining and industrial products, and are classified in nineteen groups, such as “Civil Engineering and Architecture,” “Mechanical Engineering,” and so on. JIS standards are also classified by the nature of the standards, as follows:

- **Product standards**
  These specify shape, dimensions, quality, and functions of a product.

- **Methodology standards**
  These specify methodologies of testing, analysis, inspection, and measurement. They also specify work procedures.

- **Basic standards**
  These specify terminologies, symbols, units, and formula.

(4) **Implications of JIS marking system**

The system is designed to allow a commodity to display a specific JIS marking if it conforms to the quality requirements of JIS standards.

The system is intended to allow users and consumers to select a high-quality product or a processed commodity with assurance, and it has greatly contributed to simpler and fairer transactions. To receive permission to display JIS marking on a product, internal standardization and quality management on the part of the manufacturer are strictly required; the system thus also promotes internal standardization and quality management among manufacturers.

(5) **Standardization activities of business groups and by corporations**

Business groups, academic societies, and industry associations are establishing and promoting their own group standards in their specialized fields. When it is necessary, these group standards are proposed as drafts for JIS standardization.

(6) **Observance of JIS standards and JIS markings**

Regarding government procurements, preferential purchasing is applied to JIS-certified products, in accordance with the Industrial Standardization Law, Article 26 (Observance of JIS standards).

4. **Environment of Standardization Activities**

The environment concerning standardization is currently undergoing drastic changes in Japan and world. Deregulation is causing concerned parties to make their rules more flexible. Various standardization and certification agencies are being asked to coordinate their standards in order to facilitate trade. The strategic aspect of international standards is receiving greater attention. Diversifying values of consumers are diversifying demands for standards. In spite of these developments, concerned parties in Japan have not fully recognized the importance of industrial standardization activities. The fact that fewer international standards are drafted in Japan than in Europe and US reflects this situation.
These circumstances require parties involved in the standardization of various types of technology to cooperate closely with each other and to address issues promptly, in a realistic manner. They must do so in order to vitalize, effectively execute, prioritize, and speed up standardization activities in Japan. The JISC is going to map out the following strategies to realize these goals from now on.

5. Strategies for International Standardization

(1) International Standards and Their Relationship with the JIS

° Basic Policies

The JISC will establish JIS standards as prompt as possible. For this purpose, JISC will adopt electronic process of establishing JIS standards beginning April 2002. Those systems have already completed in ISO, IEC and other main countries. The JISC is taking an active part in international discussions for establishing ISO and IEC standards. The JISC establishes JIS standards promptly in cases where the ISO and the IEC show clear signs of setting appropriate standards. In addition, the JISC will consider conforming its numerical designations to international standards, in order to clearly indicate the complete agreement of JIS with such international standards.

The JISC is taking an active part in international discussions establishing ISO and IEC standards designed for consumer protection, and makes all necessary adjustments within Japan. The JISC will do so in view of the strong possibility that such standards will form the basis of national safety regulations.

The JISC acts in concert with its counterparts in Asia and the Pacific through the Pacific Area Standards Congress (PASC) in order to ensure that regional demands are reflected in ISO and IEC standards and to secure international marketability.

° JIS and its Alignment to International Standards

The JISC harmonizes JIS to ISO and IEC standards upon its determination that existing ISO and IEC standards are proper international standards, based on its own examination thereof.

° Responses to Inappropriate ISO and IEC Standards

The JISC will propose revisions, in concert with other interested parties, in case it discovers an inappropriate ISO or IEC standard. The JISC may consider adopting the "performance standards" or the "cohabitation" method (a statement of two or more ideas) which stipulates all common technical items where two or more technologies exist on the international market and where there appears no chance for unification. The JISC will make active use of the IEC system for adding "particular conditions existing in certain countries" and states the technical conditions peculiar to Japan in the event such conditions exist.

The JISC will maintain JIS in conformity with the international market and continually seeks revision of inappropriate ISO or IEC standards when those standards remain unchanged despite Japanese proposals.
The JISC will continue its efforts to increase transparency in the process of standard development in accordance with the "Vienna Agreement" and the "Dresden Agreement." In addition, the Committee will actively participate in the CEN and CENELEC processes of standard deliberation, from the early stages.

(2) Strategic Standards and Their Proposal

Tools for International Standardization and Their Selection

The JISC will choose one of the following when proposing strategic international standards to help Japanese businesses increase their market competitiveness abroad: (1) ISO and IEC standards, (2) "new deliverables" and other means of speedy standard publication and (3) de-facto standards based on accurate understanding of degrees of industrial development, national industrial policies, and trends concerning domestic standards.

Support for Strategic Standard Proposal

The JISC encourages private businesses to propose international standards in fields where Japan leads the world. In addition, the JISC is training specialists by organizing seminars on ISO and IEC Directives and keeps a record of standardization experts in Japan, through registrations and construction of a database. Japanese government will support R&D activities of private companies which will make possible the establishment of international standards proposed by Japan.

(3) Support for International Standardization Activities

Active Contribution to Standardization Activities

The JISC will continue its efforts to increase the number of Japanese experts that serve on technical committees (TCs), sub-committees (SCs) and working groups (WGs) as chairmen, conveners, and secretariats, in a bid to boost the Japanese contribution to ISO and IEC systems deliberating international standards.

Organizational Reforms and System Development for Increasing the Number of Standardization Activity Participants

The JISC is preparing the groundwork for increasing the number of participants in international standardization activities by urging companies and industries to establish systems to promote such activities. The JISC will also try to inform business managers of the advantages to be gained through standardization, in an effort to forge systems that will enable experts to participate in international standardization activities in a continuous manner.

Support for Programs for Developing Standardization Experts in Asia and the Pacific

The JISC is encouraging standardization organizations in Asia and the Pacific to increase cooperation and providing them with technical assistance (through the PASC) in order to help regional countries train international standardization experts. The Committee will take other steps necessary for raising the level of international standardization activities in Asia and the Pacific and will urge the IEC to effectively utilize its newly established regional center in Singapore.
**Unification of Domestic Organizations Representing the ISO and the IEC with Organizations in Charge of Drafting JIS**

The JISC is making the utmost efforts to unify organizations representing the ISO and the IEC in Japan with organizations in charge of drafting the JIS, in a bid to make national standards consistent with their international counterparts. In addition, the JISC will urge domestic standard deliberation committees in related fields to cooperate closely with one another, resolve differences, and form adequate opinions, in the event that development of an international standard requires discussion in two or more TCs or SCs.

6. **Japanese Standards Association and Its Roles**

The JSA recognizes the important roles played by such internationally recognized standardization organizations as ISO, IEC. Based on this awareness, the JSA is undertaking various activities aimed at international standardization. They include (1) domestic deliberation, executive functions (secretariats), and assistance to executive organizations, (2) high-level responses to ISO and IEC initiatives, participation in international meetings, and support for participants in those meetings, (3) assistance in attempts to harmonize JIS to international standards and joint standard proposals with foreign organizations, (4) collection of current information on TBT Agreement of the World Trade Organization (WTO), (5) collection of information on certification systems in North American and European countries and (6) acceptance of trainees from developing nations, organization of overseas seminars, and provision of technical assistance to parties in need in other countries.

The international standardization strategies of the JISC, outlined above, recognized the importance of the activities undertaken by the JSA to date. The JSA decided to continue its support for international standardization activities, in close cooperation with the JISC.

7. **Standardization strategies by fields - Focus areas of standardization**

1. **Standardization regarding Information Technology**

   The need for standardization is increasing in the area of information technology, for further progress of the information society, utilizing the Internet. To encourage the healthy development of the information society, standardization in e-commerce, security management technology to support e-government, encryption technology, identification cards, multimedia technology, document processing and data processing languages, coded character sets (character coding), and content distribution will all be given preference.

   It is important to effectively establish JIS standards by giving due consideration to de facto standards of the W3C (World wide web consortium), the IEEE (Institute of Electrical and Electronic Engineers) and so on, in addition to international de jure standards of the ISO, IEC, ISO/IECJ TC1, and so on.

   With the progress of e-commerce and e-government, it will be a challenge to establish a social system that will account for the information divide, in order to create an environment where elderly people and people with disabilities will also receive the benefits of the information society. Standardization of the technologies needed for man-machine interfaces (i.e., the provision of barrier-free information) suitable for the elderly and those with disabilities will thus be promoted.
Geographical information systems (GIS) and remote education systems utilizing the Internet are viewed as important social requirements, both from a national security viewpoint (for safety preparations against natural disasters, for example) and from the viewpoint of cultural enhancement. Standardization in these areas will thus be promoted.

Platform technologies relating to the creation of information systems (such as character coding, programming languages, and software and system engineering) are increasingly required, and their standardization will continue to be promoted.

Areas of importance for standardization activities
- Security management technology, encryption technology
- Identification cards
- Character coding
- Programming languages and software and system engineering
- Multimedia technology
- Barrier-free information technology
- Geographical Information Systems, remote education system technology

(2) Standardization regarding environmental preservation

In the areas of environmental preservation and recycling of resources, standardization and international standardization activities enacted by a single industry is unrealistic to expect, as such standardization will not necessarily benefit the directly related industry. Therefore, the government should take the lead in standardization, making full use of available industry technology and expertise. In addition, independent organizations such as Industrial Technology Integration Platform Organization will be requested to play a positive role in standardization in these fields.

Environmental measurement standards, such as those for reliable measuring methods for ultra-micro chemical substances, are often referred to in environmental regulations as an example of a concrete reference value for technical standards. The government needs to not only take the lead in promoting standardization in this field but also to actively support private sectors by, for example, providing financial support for international standard deliberation groups (such as ISO/THE TRAFFIC CONGESTION 146-147) which are voluntarily operated by private organizations. To encourage the appropriate level of environmental control and regulation, we promote the establishment of JIS standards for reliable measurement methods of chemical micro substances (dioxins, or gas emissions relating to the greenhouse effect, for example).

Where product standardization is planned, environmental considerations should be systematically promoted through the definite establishment and promotion of "Guidelines for Introducing Environmental Considerations to Product Standardization" and "Environmental Considerations Standards," complying with the remaining guidelines of the respective fields. The aforementioned "Guidelines for Introducing Environmental Considerations to Product Standardization are in accordance with ISO Guide 64 (J IS Q 0064), which was established
with the aim of achieving a balance between product functions and the environmental load caused by a product throughout its life cycle.

Thorough promotion of the "3R" idea (i.e., the three "Rs" Reduce, Reuse, and Recycle) is required. Looking into the 21st century, it is urgently required that we establish a "recycling economic social system," to allow for compromise between effective environmental preservation and sustainable economic growth. To meet this need, standardization activities should play an important role - taking advantage of the JIS system in implementation of environmental policy, for example.

Areas of importance for standardization
- Product standards not only relating to product recycling but to 3Rs as a whole.
- Standardization of measurement methods that will secure the quality of recycled products and reused products
- Establishment and promotion of standards that will help the design of environmentally acceptable products
- Product development guidelines to aim at longer product life (easy-to-repair design, information disclosure relating to product repair, test methods for aging devices)

(3) Standardization reflecting viewpoints of consumers, elderly people, and people with disabilities

(For consumers)
- In the context of economical globalization, an internationally acceptable framework for protecting consumers is required for cross-border transactions. This will be complementary to consumer protection through domestic laws and regulations. For example, discussion is now taking place at the ISO concerning international standardization regarding claim-settlement procedures. In the industry sector, voluntary moves have been made to establish international standardization covering the scope of business activities, dispute settlement, and accountability. Along with these developments, a JIS guideline was established last year for as claim-settlement management system. We will proceed with de jure standardization in the future as well, based on consumer opinion and needs, in compliance with related international activities.

Important challenges
- Standardization for consumer protection (business ethics, out-of-court dispute settlements)
- How to make product standards familiar to consumers through JIS marking
- Promotion of consumer participation in establishing standards. Recognition of standardization activities by consumers.

(For elderly people and people with disabilities)
- Interest is increasing in standardization for elderly people and for people with disabilities. At the ISO/TMB Ad hoc TAG, guidelines for developing standards for the elderly and those with disabilities were established (ISO/IEC Guide 71 – Guidelines for Consideration of Needs of the Elderly and People with Disabilities When Designing Standards) according to a proposal by the ISO/COPOLCO (ISO Committee on consumer
We will continue to take the initiative in international standardization with consideration of the elderly and those with disabilities. We will also actively work toward the establishment of guidelines for consideration of the elderly and those with disabilities in each field.

It is hoped that both people with disabilities and people without disabilities will participate equally in social activities and live independently; in other words, that "normalization" may develop. To support this development, we will map out product-design guidelines with the elderly disabled in mind, with the aim of facilitating the design and promotion of products and services which may be used easily and safely. For this purpose, we will immediately undertake to collect and compile human data relating to the body shapes of elderly people and people with disabilities, for example.

Europe has been actively working on standardization relating to "usability" of products. Japan has also been taking related initiatives, in ISO/TC159 (Ergonomics), and SC1 (Guidance Principles of Ergonomics)/secretariat of WG4, and we will continue these efforts. [In June, 1999, the ISO13407 (JIS Z 8530 Ergonomics / Human-Oriented Interaction System) was established. European corporations have already established certification businesses in this area.]

(4) Standardization for manufacturing technology and industrial platform technology

In place of a conventional open system from upstream (design) to downstream (manufacturing, production), a closed system of products based on recovery, disassembly, recycling, and reuse must be considered. We will place our efforts on the standardization of overall production processes and the modernization of repair, recovery, and disposal systems after production, as opposed to a standardization system leaning more towards devices, equipment, and software.

In the ISO/TC213, standardization of GPS (Geometrical Product Specifications) has progressed systematically. GPS aims at the unification of the definitions of dimensions, shape, and tolerance required in the series of processes from design to verification of machine parts, as well as the unification of the methods of instruction. Eliminating ambiguity in technical specifications, for the smooth establishment of a global production system is considered to be the foundation of GPS standardization. The production system for industrial products in Japan will very likely be affected. It is important to research trends overseas, to exchange information at the ISO, and to make all necessary proposals.

Surface chemical analysis technology will be key in the determination of chemical composition or surface conditions of substances in areas of nano-technology and material technology, which are expected to form a foundation of industry. Standardization of this area is now being discussed at ISO/TC201, which was established to standardize the joint international research results of VAMAS (an international collaboration regarding new materials and standards) begun in 1983. We performed an executive function and will strengthen our ties to R&D and international standardization activities, in our efforts to establish international standards based on our industrial technologies.
Standards for machine safety is an area where de jure standards should be established, in view of meeting particular social needs (i.e., labor safety). Systemization in this area is ongoing for machinery (at the ISO) and for the electronic and electrical field (at the IEC) internationally, centering on the ISO/IEC Guide 51 (Guidelines for the Inclusion of Safety Provisions in Standardization). We believe it is necessary to continue discussions of internal standardization, with the aim of increasing security and enhancing safety through the establishment of such standards.