Engineers Qualification System and Internationalization of Design Standard in Japan

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1. Consulting Engineers System in Japan

The Consulting Engineers System is one of the major qualification systems for engineers in Japan that supports advancement of science and technology for sustainable economy and social development. The Consulting Engineers System is a national qualification system that certifies engineers' capacity and helps to develop the engineers to advanced professionals having a broad range of abilities. It is also intended to strengthen the technical skills of engineers based on the Consulting Engineers Law in order to build a creative country through development of the science and technology.

Certified Consulting Engineers are considered as highly valued engineers who have the professional level of capability and enable to perform their technical work independently with professional ethics and sufficient knowledge in their fields.

The Consulting Engineers System covers 20 fields of science and technology in engineering including construction, mechanical, water supply, electrical and electronic, chemical, agricultural, forestry, and fisheries engineering. The current total number of registered Consulting Engineers is 53,600, and numbers of engineers who had registered by March 2003 in each technical fields are 25,800 (48.1%) in the construction engineering that holds the largest number of engineers, 3,400 (6.3%) in the electrical and electronic engineering, 3,400 (6.3%) in the water supply engineering, 3,100 (5.7%) in the mechanical engineering, and 2,600 (4.9%) in the agricultural engineering.

In April 2000, the qualification system was revised for adapting to the international standard corresponding to the mutually recognized system for certified engineers among countries and for ensuring the responsibility for Counting Professional Development (CPD) and pursuit of public benefits with professional ethics.

2. Current Situation of the APEC Engineers Project in Japan

The Japan APEC Engineers Monitoring Committee has started accepting applications for the APEC Engineers since 20 November 2000. Followed by seven assessment meetings, 2,348 cases in five fields have been qualified as the APEC Engineers consisted of civil (1,939 cases) structural (397), mechanical (2), electrical (7) and chemical (3) engineers.

For the irrigation, drainage and reclamation engineering, 106 cases have been registered as the APEC Engineers in the fields of civil and structural engineering.

In addition, Japan and Australia agreed to establish a bilateral framework to facilitate the mutual recognition of registered engineers in October 2003. This framework applies to the disciplines for which both countries have a similar scope such as mechanical, electrical and chemical engineering as listed in the APEC Engineer Manual.

Needless to say, agriculture, forestry and fisheries are the key industries in the Asia and Pacific region, and exchange of knowledge on science and technology within this region is essential to promote the development of these industries. We are, therefore, endeavoring to nurture the APEC Engineers in harmony with every economy concerned and expecting to establish the technical fields of agriculture, forestry and fisheries as additional fields for the registration of APEC Engineers.

3. Internationalization of Japanese Technical Standards

Along with establishment of the international certified system of engineers, it is important to develop international technical standards for Japanese engineers.

In Japan, the technical standards for design of structures have been independently developed in each structure such as civil work structure, building structure, steel structure, concrete structure, and foundation structure. Though this has been effective from the aspect of optimizing structural design of each specific structure, the presence of technical standards for every single type of structures may impair the accountability of design, which has been increasingly advocated in recent years.

The Government Procurement Agreement of the WTO (World Trade Organization) requires national organizations of member countries to observe the international standards formulated by the International Organization for Standards (ISO), in which standardization of design and construction is also in progress. The policy of these international standards under formulation tends toward establishment of general technical standards common to most structures while formulating technical standards for each type of structure is regarded as matters specific to the characteristics of each type.

In principle, the ISO Standards require to verify the performance on design of buildings and public works with a concept of reliability design. That is to say, we have to change the Japanese design standard from traditional 'specification-based design' to 'performance-based design.'

Considering these situations, when we revise the Japanese standards including in agricultural fields, we converge into internationally viable technical standards through continuously contributing to further discussion across frameworks of various fields.

4. Conclusion

More than 2,300 APEC Engineers have been registered in Japan. We are endeavoring to establish the technical fields in agriculture, especially in the field of the irrigation, drainage and reclamation engineering, as an additional field for the registration of APEC Engineers. With the registration system of the engineers, we will revise the Japanese domestic standards to internationally viable standards.

Finally, I have high expectation on the textbooks for engineering education in ecosystem preservation and performance design, etc. that were proposed in the Kyoto Statement in 2003 for publication in the near future.