Strategy research of internationalization of engineering construction standards for the Belt and Road Initiative

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Abstract. To establish a comprehensive, multi-layer and multi-disciplinary network is the major aim of the “Belt and Road Initiative (BRI)”. Infrastructure connectivity is the main global trend and the basis of connection for trade and people communications, and it becomes the high priority of development of the BRI. Standards are the basic rules for connectivity, and engineering construction standards are also seen as the technical references for economic activities and general language worldwide, which play the important roles during development of the BRI. In order to explore the development strategy for internationalization of engineering construction standards, this paper firstly analyze the development status and demand of standardization of engineering construction of the countries and regions encompassed by the infrastructure corridors based on the investigations, and then, an in-depth analysis on internationalization of engineering construction standards in China is carried out. Finally, multi-level suggestions on internationalization of engineering construction standards promotion have been presented.

1. Introduction

On August 30, 2015, the General Office of the State Council proposed to focus on initiatives including the “BRI”, “Made in China 2025“, and international production capacity and equipment manufacturing cooperation. The work plan of “going global” Chinese standards was formulated, promoting the “going global” standards in key areas such as railway, electric power, steel, aerospace and nuclear. Action plan for the Belt and Road standards connection shall be developed, promoting comparative analysis of countries along the BRI, commodity standards and energy efficiency standards for end-use energy products. Translation and publication of Chinese standards in foreign languages should be strengthened, increasing mutual recognition with major trading countries, and promoting the construction of overseas agricultural standardized demonstration zones. Standardized expert exchange and talent training programs for Russia, Central Asia, ASEAN and Africa should be conducted [1]. In October 2015, Action plan for standard connection on ”Belt and Road Initiative“ (2015-2017) was officially released, which raised the concerns of countries encompassed by the BRI, deepened standard and mutually beneficial cooperation, promoted investment and trade facilitation through standardization, and promoted “going global” Chinese standards [2]. In December 2017, based on the previous work, Action plan for standard connection on ”Belt and Road Initiative“ (2018-2020) was proposed. Inter-country standards interchange and recognition action, overseas standardization demonstration and promotion action, Chinese standard translation action, and enterprise standards internationalization actions are among the key tasks in the nine special duties, and were required to be intensively carried out [3].
The internationalization of engineering construction standards means the degree of which engineering construction standards are accepted and adhered to by the relevant parties in international trade and engineering construction, and the continuous improvement process of content, technical level and expression of standards in order to achieve a certain degree of acceptance [4]. Engineering construction standards, as a common technical guideline, are mainly used in trade and production as a bridge to the global market. Promoting multilateral and pragmatic cooperation and interconnection in the internationalization of engineering construction standards, facilitating mutual recognition of engineering construction standards, and accelerating the internationalization of China’s engineering construction standards are beneficial for “going global” Chinese standards and achieve internationalization, and helpful to support “going global” China’s industry, products, technology, engineering.

2. Status and Needs of Standardization of Engineering Construction in Countries and Regions along the Belt and Road

2.1. Development of engineering construction standardization

2.1.1. Status quo of China’s engineering construction standardization
At present, China is jointly developing international standards with countries along the route to promote world connectivity. In 2016, China successfully hosted the 39th International Organization for Standardization (ISO) Conference to discuss Standards for World Interconnection. The conference issued Beijing Declaration, focusing on the common development concerns of countries along the route, close cooperation in the fields of railways, electric vehicles, aviation, robotics with countries along the Belt and Road such as France, Germany, Sweden and Russia, and utilizing the advantages of those countries serving as the head or the secretariat of the technical organization of the international organization for standardization to promote the joint development of international standards [5]. The National Standards Committee has signed standardization and mutual recognition cooperation agreement with 21 countries along the Belt and Road countries. It also signed 62 mutually recognized British standards to promote trade facilitation [6]. In addition, non-governmental standardization organizations have also carried out standardization cooperation agreements with overseas standardization organizations. For example, the China Engineering Construction Standardization Association and the Canadian Standards Association Group have signed a memorandum of cooperation, which is conducive to standardized exchanges and cooperation in engineering construction [7].

China has presided over or participated the formulation of a number of international standards led by International Railway Federation. For example, Kenyan Mombasa-Nairobi Railway is built with China’s standards. During its construction, the project combined Chinese standards with local laws and regulations, local requirements and other localization requirements [8]. Exploration and guidance of standards is not only reflected in the railway system, but also in China’s residential industrialization. Broad supported the R&D and production of complete and finished houses with China’s standards, which have been exported to Brazil and Suriname [9].

2.1.2. Status Quo of Standardization Development of Engineering Construction in Countries and Regions along the Belt and Road
Survey gathered the information on the standardization of engineering construction in six regions covering 16 countries along the Belt and Road. The status quo of national and regional engineering construction standardization along the Belt and Road is analyzed in detailed as follows:

1. The development level of engineering construction standards varies greatly among countries, and some countries have not developed a well-established project construction standard system. Countries and regions in Southeast Asia and South Asia have established a relatively complete and self-contained engineering construction standards system, and have been or are exploring standard
internationalization. Countries in Central Asia and West Asia have not yet established their own national standards for engineering construction, and even no internationalization of standards.

2. The national engineering construction standards along the Belt and Road are greatly influenced by the developed countries in Europe and America. The engineering construction standards of most countries in South Asia and West Asia are mainly based on the standard systems of European and American countries.

3. Due to language barriers, weak standard system foundations, low international awareness, and serious local protectionism, some national construction standards systems are not well-established, and it is difficult to apply standards in other countries. In addition, as most countries gradually realize the importance of standards, they are developing and improving their own national standards system, and regard domestic standards and international standards as an important direction for future development.

4. The standardization of engineering construction in countries with relatively developed economies is more complete and comprehensive while that in countries with relatively backward economies is relatively lagging behind. With the continuous economic development, countries have begun to realize the importance of international exchanges and internationalization of standards, and have begun to adopt various methods and measures to improve and promote the internationalization of their national standards.

5. Countries along the Belt and Road have the need to develop local engineering construction standards. As Chinese companies go global, Africa expressed its willingness to let Chinese companies help to establish the country’s standard system and develop relevant standards. Some countries in Africa and East Asia expressed their willingness to jointly develop standards in informal settings. At present, Chinese enterprises are carrying out preliminary research projects in African countries, making preliminary preparations for system formulation and standard development.

2.2. Requirements for engineering construction standardization

Through questionnaires and interviews, this paper summarized the use of engineering construction standards by 7 Chinese enterprises in 8 overseas countries, and analyzed the demands for standardization. Investigation finds out the following five problems in the overseas use of Chinese standards:

1. There is no sufficient foreign language version of the Chinese standard. The foreign language version system is also not well-established and lacks persuasiveness, so overseas countries mainly adopt European and American standards. Chinese business departments and project companies of many engineering construction enterprises overseas have consistently expressed their opinions, saying that in the process of developing overseas projects, there is an urgent shortage of foreign language versions of Chinese standards and Chinese translations of foreign standards. Secondly, due to cultural and linguistic factors, engineering projects in overseas countries are more accustomed to using European and American standards than Chinese standards. In addition, the Chinese standard translation system is not complete, which seriously restricts its scope and intensity of promotion.

2. There are fewer ways to obtain Chinese and foreign standards. Some enterprises responded that there are fewer ways to obtain Chinese and foreign standards, and it is difficult to obtain the full set of standards necessary for engineering construction.

3. The Chinese and foreign standards translated by the company itself are not accurate enough. The translation takes a lot of manpower and material resources, but does not convey the original meaning. Due to actual needs, some enterprises spend a lot of manpower and materials to translate some Chinese and foreign standards on their own, but quality problems of unprofessional translation exist.

4. Differences between Chinese and foreign standards, lack of comparative explanations, differences in understanding between the two sides make it difficult to use standards. From the feedback from overseas business units and project companies, due to the differences between Chinese and foreign standards and the lack of corresponding comparison instructions, there are often
differences in understanding among Chinese and foreign units and engineering personnel in the process of project implementation.

5. The Chinese standard is not combined with the local situation. In overseas engineering construction projects, the Chinese standard is not always combined with the local situation. For example, overseas projects require calculation in great detail, but some content is not covered by domestic standards.

3. Problems Analysis of Promoting the Internationalization of Project Construction Standards of the Belt and Road Initiative

Generally speaking, there are four major problems in China’s engineering construction standards in supporting the construction of the Belt and Road.

1. The scope of China’s mandatory standards and recommended standards do not match with each other. According to the WTO/TBT regulations, the content of technical standards shall be mainly limited to five aspects: protecting personal safety and human health, protecting the life and health of animals and plants, protecting the environment, preventing fraud, protecting consumers’ interests and protecting national security. According to this regulation, 17.93% of China’s engineering construction standards do not meet the requirements [10].

2. The international promotion of China’s engineering construction standards is not compatible with the requirements of the Belt and Road construction. The present China-led international standards only account for 0.5% of the total, and the scope and application areas of the Chinese standards that go global are still relatively small. Among the projects implemented by China’s transportation design and construction enterprises in the Belt and Road countries, only more than half of the projects in Pakistan and Bangladesh have adopted Chinese standards while most other countries adopt domestic or European standards. In addition, Chinese companies are not keen on organizing and participating in standardization-related activities in countries where international or foreign-related projects are located. More than half of the research companies have never participated in such activities.

3. The translation and publication of China’s engineering construction standards is not suitable for the demand of enterprises to go global. According to incomplete statistics, up to now, about 300 Chinese engineering construction standards have been translated and the official English version has been published. The pace of compiling Chinese engineering construction standards in foreign languages is far behind the demand of Chinese enterprises to go global.

4. Language communication and talent reserve do not match. Many countries along the Belt and Road speak minority language have difficulties in exchanges and communication. There is a lack of talents who are familiar with international and domestic standards and comprehensive talents who master both standards and language. Survey shows that most enterprises have not equipped with personnel specializing in the internationalization of engineering construction standards, but they all indicate such demand, showing that the high demand and insufficient supply of internationalization talents in China’s engineering construction standards.

4. Suggestions for Promote the Internationalization Strategy for the Belt and Road Project Construction Standards

In conclusion, this paper offers suggestions from the perspectives of the government, industry associations and enterprises. Firstly, the government should strengthen international cooperation on standards, promote the mechanism of standard mutual recognition with countries, and carry out research on the localization of Chinese standards. The government should establish an official information platform for standardization of engineering construction to provide information sharing services both in Chinese and foreign standard and keep updated. The government shall translate the Chinese standard and the foreign standard. Chinese investment and aid construction of overseas projects should actively adopt the Chinese standard. Secondly, at the industrial level, it is recommended to strengthen communication and mutual visits between industry associations to learn from each other and to integrate engineering construction standards among industry associations, the
integration of Chinese standards with international standards, and the establishment of unified standards. Industry associations should master the application of standards and timely adjust and update standardization initiatives; strengthen comparative research on Chinese and foreign standards, improve Chinese standards, and increase the number of translated Chinese and foreign standards; issue targeted application cases at home and abroad; establish a directory of international and domestic standards and a standard library of Chinese and English versions; participate in international standardization activities, and actively promote Chinese standards. Thirdly, the enterprises are recommended to actively promote and use Chinese standards, and accumulate experience learned in the use of Chinese and foreign standards; strengthen communication with the government and industry associations, and timely provide feedback; adopt new techniques, processes, materials, and equipment that meet relevant standards so as to improve the project quality, play the role of demonstration, and increase the recognition of Chinese standards.

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