

## OIML-CS

# The implementation of the OIML-CS in P.R. China

CAI CHANGQING<sup>1</sup>, LI XIAOMENG<sup>1</sup>, CHEN HANGHANG<sup>1</sup>, ZHENG HUAXIN<sup>2</sup>

<sup>1</sup> National Institute of Metrology, Beijing 100029, P.R. China

<sup>2</sup> State Administration for Market Regulation of P.R. China, Beijing 100088, P.R. China

## 0 Introduction

In recent years, with the rapid development of science and technology and the acceleration of the globalization process, the regulation system for measuring instruments in China has been continuously improving and increasingly conforms to international standards. In the meantime, in the context of global integration, the mutual recognition of international metrology is becoming an important vehicle for advancing global trade cooperation, infrastructure interconnection, and economic growth. Since 2017, in order to adapt to the development of the OIML Certification System (OIML-CS), China has also undergone considerable changes in the structure of its legal metrology system.

This article presents China's participation in the activities of the OIML over the years, and the work that has been done for China's participation in the OIML-CS, such as the adjustment and reconstruction of the OIML

Issuing Authority and Utilizer in China. It also briefly introduces China's current regulatory requirements for new measuring instruments and the various work that China has done to promote the effective implementation of the OIML-CS.

## 1 China's participation in the OIML-CS and its recent development

### 1.1 Historical overview of China's participation in the OIML

China joined the OIML in 1985. Thereafter, China joined the OIML Basic Certificate System in 1992 and signed the Declaration of Mutual Confidence to join the OIML Mutual Acceptance Arrangement (MAA) in 2006. The Office for OIML Affairs in the former General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ) acted as the Issuing Authority (IA) during this period and was responsible for issuing OIML certificates. At the same time, the National Institute of Metrology (NIM), as the nation's highest research facility for measurement science and a national statutory authority in the field of metrology, was responsible for performing OIML tests and providing core technical support to the Office for OIML Affairs in these issues (see Figure 1). During the same period, in order to help measuring instrument manufacturers enter the global market more smoothly, China also made a great effort to establish mutual confidence with other countries. Since 1999, AQSIQ has signed a series of Mutual Recognition Arrangements (MRAs) with NMI (NL), PTB (DE), NWML (UK) and METAS (CH) respectively.

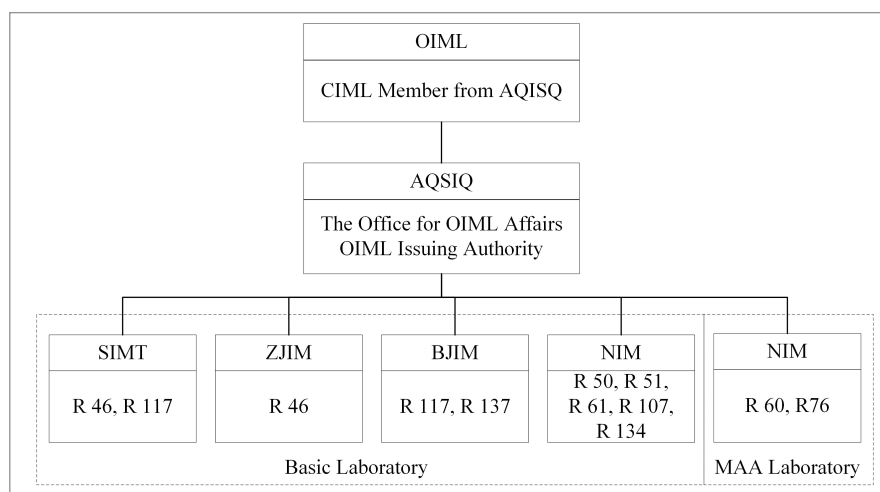


Figure 1: Former structure of OIML affairs in China before 2018

## 1.2 Establishment of a new OIML Issuing Authority in China

At the initial stage of the development of the OIML-CS, China sent experts to participate in the work of the MAA Ad-hoc Working Group, the provisional Management Committee, and other relevant working groups. Through these working groups, Chinese experts participated in and followed up on the development of the OIML-CS. On behalf of China, the experts put forward opinions and constructive suggestions for adopting and developing the regulation of the OIML-CS.

As for the establishment of an OIML Issuing Authority in China, AOSIQ could no longer meet the requirements of being an OIML IA under the OIML-CS due to its administrative nature. NIM became the natural alternative, given the institute's consistent participation in OIML work and its strict quality system, advanced metrological technology, and high quality human resources. Accordingly, on May 20, 2017, with the joint efforts of AOSIQ and NIM, the former CIML Member for China and former Vice Minister of AOSIQ, Mr. Wu Qinghai wrote to the BIML to designate NIM as the OIML Issuing Authority of China.

Subsequently, NIM actively invested in the establishment of the new OIML Issuing Authority. In 2017, NIM established an OIML certification office on its Changping campus. In the same year, NIM drafted a Quality Manual and relevant quality documents and completed the construction of the quality system of its OIML Issuing Authority according to the requirements of ISO/IEC 17065 and OIML D 29. In addition to the OIML IA quality system, the OIML-CS is also highly dependent on the testing capabilities of test laboratories. Regarding the construction of OIML test laboratories, in 1999 NIM obtained the qualification to perform OIML tests as a designated test laboratory.

As the former OIML MAA test laboratory, NIM possesses complete and advanced test equipment and professional personnel. Its quality system continuously meets the requirements of ISO/IEC 17025. The third-party laboratories of NIM, the Shanghai Institute of Measurement and Testing Technology (SIMT), the Zhejiang Province Institute of Metrology (ZJIM) and the Beijing Institute of Metrology (BJIM), were also the designated test laboratories under the OIML Basic System. These three test laboratories are all provincial metrology institutes in China and have participated in the drafting or revision work of the international and national metrological standards of the relevant instrument categories. The personnel of these third-party laboratories has participated in the relevant technical committees and has rich experience in the field of type evaluation of relevant measuring instruments. Their quality system and technical capability meet the requirement of the relevant OIML documents. At that point, the scope of the OIML Issuing Authority of China covered multiple legal measuring instruments such as non-automatic weighing instruments (R 76), automatic weighing instruments (R 51, R 61) load cells (R 60), and active electrical energy meters (R 46).

In November 2018, NIM went through international peer assessment for its OIML Issuing Authority and internal test laboratory, during which the assessors spoke highly of NIM's quality management system and technical capability. Based on this assessment, NIM applied to modify the scope of the relevant measuring instruments from Scheme B to Scheme A respectively according to the OIML-CS transition period arrangement (NAWI and AWI). From this moment on, NIM can conduct OIML type evaluations and issue OIML certificates under Scheme A for relevant types of measuring instruments based on the requirements of OIML Recommendations.

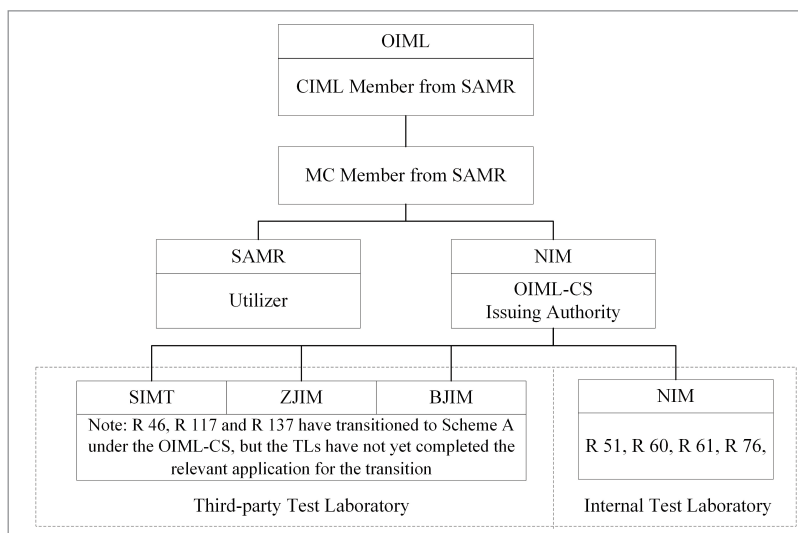


Figure 2: Current OIML structure in China

## 2 Promoting the use of OIML certificates

### 2.1 Utilizers in China

During the development process of the OIML-CS, in addition to OIML Issuing Authorities, the OIML also proposed the concepts of “Utilizer” and “Associate”, which refer to the national issuing authority or national responsible body from an OIML Member State or Corresponding Member that has signed the Declaration, specifying the terms of acceptance of OIML certificates and/or OIML type evaluation reports issued under Scheme A or Scheme B. This means that only when the Utilizers and Associates sign the Declarations and commit to accepting OIML certificates are the objectives of the OIML-CS (including but not limited to avoiding unnecessary re-testing, fostering mutual confidence among participating members and facilitating the global trade of individual instruments) truly realized. Therefore, the continuous expansion of the number of Utilizers and the scope of the certificates that Utilizers commit to use is an important part of promoting mutual recognition.

Generally, the Utilizer is the national authority that is responsible for issuing certificates of national type approval. Therefore, the Utilizer in China is the State Administration for Market Regulation (SAMR, formerly AQSIQ). Among the existing OIML Issuing Authorities in 12 countries, only China’s OIML IA and Utilizer belong to two different organizations. In order to explain the reasons for this, we provide below a brief description of China’s metrology management system.

China’s metrology management is mainly undertaken by the metrology administrative department and technical institutes. The metrology administrative department is mainly based on the metrology administrative departments of governments at all levels, which are mainly responsible for the management of metrology. They are established to ensure the smooth progress of metrology. The departments are divided into administrative levels such as provinces (autonomous regions and municipalities), cities, and counties, forming a stepped hierarchical structure. However, the metrology technical institutes form a hierarchical and regional network based on the characteristics of the administrative management system and the dissemination of quantity values.

The main technical institutes include NIM and the metrology technology institutes of various provinces, cities and counties, and the metrology testing centers of enterprises and institutes. Their main responsibility is to realize the dissemination of quantity values, carry out metrology verification, conduct research on measurement standards, and provide technical support for legal metrology.

In China, measuring instrument manufacturers must ensure that the measurement performance of their samples of new products obtain the type approval of the metrology administrative department at or above the provincial level before they are put into production. Taking into account the regulatory needs, China compiled the *Measures for the Administration of New Products of Measuring Instruments* for measuring instruments that require type evaluation and type approval. China also issued a supporting document entitled *Catalogue of Measuring Instruments control by Law (Part of Type Approval)* and all measuring instruments within the scope of this catalogue need to apply for type approval. Regarding the type approval of imported measuring instruments, China issued the *Measures for the Supervision and Administration of Imported Measuring Instruments of the People’s Republic of China*. In 2020, SAMR unified the Catalogues of imported and domestic measuring instruments. As a consequence, SAMR issued the *Catalogue of Measuring Instruments under Compulsory Management*. Thereafter, the number of measuring instruments requiring type approval has been reduced from the original 75 categories to the current 32 categories.

Currently, the Provincial Administration Bureaus for Market Regulation are responsible for the type approval of new products in their own regions, and SAMR is responsible for the supervision and management of the type approval of new measuring instruments nationwide. Meanwhile, SAMR is responsible for the relevant applications and type approval of imported measuring instruments. Therefore, domestic manufacturers need to apply for type approval to the Provincial Administration Bureaus for Market Regulation where the product is produced, while imported measuring instrument manufacturers and their agents need to apply to SAMR for type approval. Once the administrative department accepts the application, it will entrust the corresponding technical institute to carry out the type examination and testing on the sample of the product in accordance with the relevant national standards. If the measuring instrument passes the type examination and testing, it will obtain a type approval certificate and can then be put into production.

Per the description above, the technical institutes are only responsible for performing type evaluation testing on measuring instruments. It is the metrology administrative department that undertakes the responsibility of issuing national type approval certificates. Despite these differences, SAMR, as the Utilizer, has also done a lot of work to promote the implementation of the use of OIML certificates.

## 2.2 The Utilizer promotes the use of OIML certificates

In order to actively participate in international mutual recognition and promote the use of OIML certificates in China, in 1991 the former State Bureau of Technical Supervision (SBTS) issued the *Notice on the implementation of the OIML Certificate System* nationwide. This marked the official implementation of the OIML Basic Certificate System in China. In 2005, China revised the *Measures for the Administration of New Products of Measuring Instruments* implemented in 1987. The document referred to OIML D 19 *Pattern evaluation and pattern approval* and adopted a unified management mode type approval, including type evaluation and the decision of type approval. The concepts of pattern evaluation and prototype testing were unified into type evaluation. This revision made China's regulation more consistent with international conventions and common practices. The unified type approval management is conducive to strengthening the supervision and management of government and improving the quality of measuring instruments. This also provided the possibility to use OIML certificates widely.

In March 2018, due to the institutional reform of the State Council, AQSIQ merged with the State Administration for Industry and Commerce (SAIC) and the China Food and Drug Administration (CFDA) to form the SAMR. After the reform, as an active response to the development of the OIML-CS and its implementation in China, SAMR issued the *Notice of the General Office of SAMR of using OIML Certificates to issue Type Approval Certificates*. According to this document, the applicant only needs to have its OIML certificate and relevant test reports reviewed by the designated technical institutes, before applying to SAMR for a national type approval certificate. This will help manufacturers to avoid unnecessary re-testing when obtaining national type approvals.

Through years of hard work and the series of reforms mentioned above, China's type approval system of measuring instruments is now even more in line with international standards and compatible with the OIML-CS. This extends the scope and enhances the level of China's metrology mutual recognition, further realizing the interconnection of international metrology.

## 3 Raising the awareness of the OIML-CS

China is not only deeply involved in the development of the OIML-CS, but also carries out a lot of work to promote the awareness of the OIML-CS in China and around the world.

In order to successfully implement the requirements of the OIML-CS in China, after OIML B 18 *Framework for the OIML Certification System* was approved by the CIML the former AQSIQ and NIM cooperated many times to hold promotion meetings, trainings and other activities in Hangzhou, Shanghai, Beijing and elsewhere. These activities publicized the direction and specific content of the development of the OIML-CS to various market supervision and management departments, provincial metrology institutes, and manufacturers. The changes and challenges were also pointed out. To ensure that the process of issuing OIML certificates meets the requirements of ISO/IEC 17065 and OIML D 32, NIM held several seminars in 2018 to develop relevant quality documents to coordinate the interface between the Issuing Authority and its internal and third-party laboratories.

At the end of 2019, with the support and help of the BIML, the Chinese translations of B 18 and related Procedural and Operational Documents were published by NIM and provided to the public for free. The translations are also available for download on the OIML website.

In 2021, the National Legal Metrology Technical Committee established a working group under the leadership of SAMR to work on OIML-CS matters. Representatives from various stakeholders such as Issuing Authorities, Utilizers, Test Laboratories and manufacturers are all part of this working group, which will be responsible for tracking and studying the relevant regulations and procedures of the OIML-CS, and organizing relevant technical institutions to participate in the revision and feedback of OIML Recommendations. This working group will also be responsible for drafting and revising the *National Technical Specifications for Metrology*, aiming at further promoting the implementation of the OIML-CS in China.

Internationally, in order to promote the OIML and the OIML-CS on a global scale, the OIML established an OIML Pilot Training Center (OPTC) in China in 2016 and successfully held the first training course on OIML R 76. In 2017, NIM organized training on Weighing in Motion and the program was well received by 40 trainees from various countries.

In 2018 and 2019, seminars organized by the PTB and NIM were held in Jingdezhen, China and Munich, Germany respectively, to discuss the problems encountered at the beginning of the implementation of the OIML-CS and share experience to ensure its smooth operation.

In 2018 at the 25th Asia-Pacific Legal Metrology Forum (APLMF) meeting, the APLMF established an



Figure 3 (a): OPTC

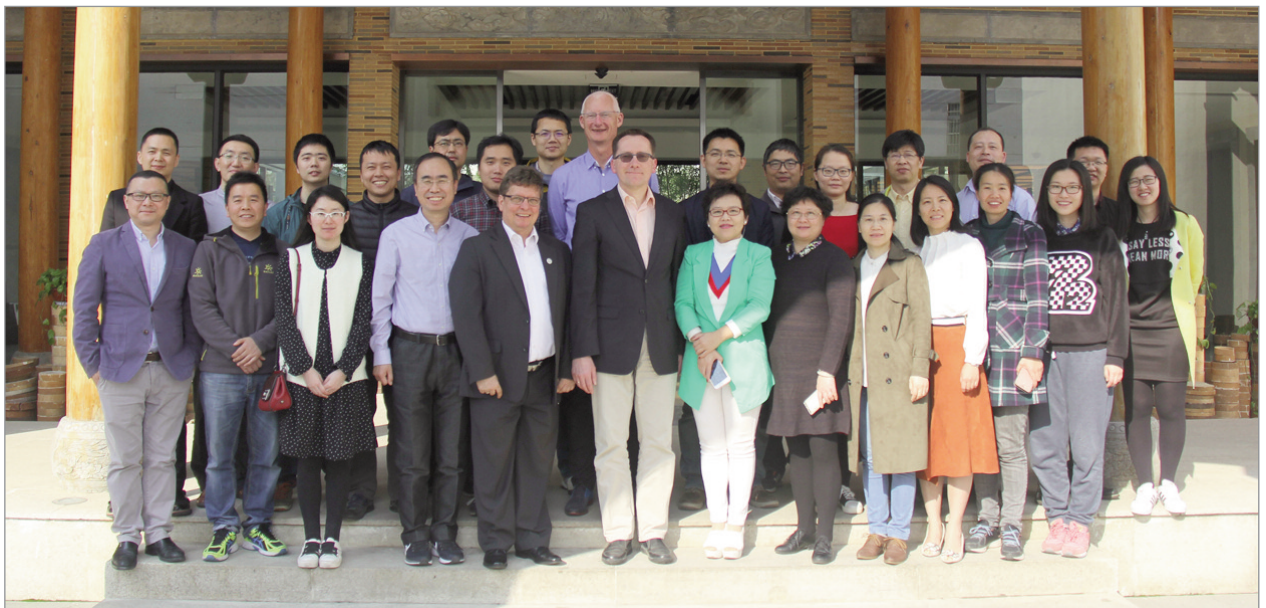


Figure 3 (b): Seminars between the PTB and NIM in Jingdezhen

OIML-CS working group and SAMR sent staff to participate and took on the role of WG chair. This working group is committed to raising awareness of the OIML-CS and to promoting the acceptance and use of OIML certificates in emerging economies. As the chair of the OIML-CS working group, China drafted a questionnaire to obtain feedback and information on experiences concerning the OIML-CS from the group

members. In 2021, a promotional animation about the OIML-CS was also completed by China. The animation starts with the introduction of legal metrology and international mutual recognition, and then leads on to the OIML and the OIML-CS. It also provides an example of the process for obtaining an OIML certificate and how to use it. The animation introduces and promotes the OIML-CS to interested parties in a more vivid way.

