Economy Report - 2019

Japan

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SECTION 1 – Organisation and structure for metrology

Organisation Structures

Metrology Policy Office, Industrial Science and Technology Policy and Environment Bureau, Ministry of Economy, Trade and Industry (METI) is responsible for both scientific and legal metrologies as the custodian of Measurement Act.

National Metrology Institute of Japan (NMIJ) is part of National Institute of Advanced Industrial Science and Technology (AIST) and supports METI as a group of technical experts. NMIJ supports also liaisons between the international organizations. The CIML member has been provided by NRLM (National Research Laboratory of Metrology) before 2001 and by AIST afterwards.

NMIJ, which consists of four research institutes and one center, maintains the national primary standards (see **Figure 1**). In legal metrology, NMIJ provides services for type approval, inspection of verification standards (working standards used for legal metrology) and training of domestic experts in metrology. Research Institute for Engineering Measurement (RIEM) of NMIJ provides most of the testing services for legal metrology. CQMM (Center for Quality Management of Metrology) supports legal metrology through international cooperation and maintenance of the quality systems. Research Institute for Physical Measurement (RIPM) and Research Institute for Measurement and Analytical Instrumentation (RIMA) also support part of the testing services in legal metrology.

In addition, **JEMIC** (Japan Electric Meters Inspection Corporation), **JQA** (Japan Quality Assurance Organization) and **local verification institutes** in the 47 prefectures support the national infrastructure for legal metrology.

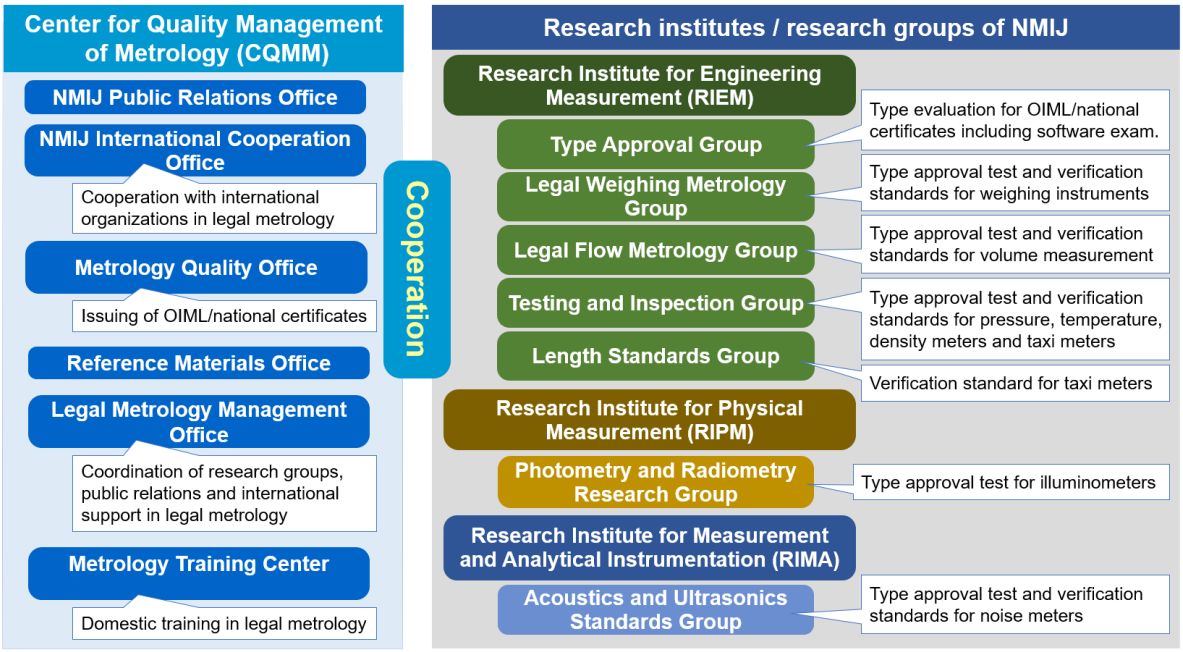

Figure 1 Structure of NMIJ

Legislative Frameworks

Japan participated in Metre Convention in 1885 and OIML Convention in 1961. The national framework of legal metrology, scientific metrology and traceability system is specified in **Measurement Act** (1992). This act stipulates that the **specified measuring instruments** in the 18 categories should be controlled under legal metrology for ensuring the reliability in transactions and certifications, and they are basically subject to type approval and/or verification. The act is also supplemented with cabinet orders, ministerial ordinances and Japan Industrial Standards (JIS).

NMIJ (AIST) and JEMIC are specified as the implementing organizations of national **type-approvals**. Initial and periodical **verifications** are conducted by local governments, Designated Verification Institutes (DVI), Designated Manufacturers (only for initial), JEMIC and JQA. Verification periods are specified depending on the categories of instrument (e.g., 2 years for NAWI).

International arrangements and engagement

Regarding the **OIML's technical activities**, Japan joins many TCs (technical committees) and SCs (sub committees) as a P (participating) member. With support of the domestic mirror committee to OIML, Japan submits many comments to approximately 30 inquiries per year regarding the OIML publications.

In **OIML Certificate System** (OIML-CS), AIST is responsible for a testing laboratory as well as an issuing authority of the instrument categories on R 60 (load cells) and R 76 (non-automatic weighing

instrument) in the scheme A. OIML certificates issued in other countries may be accepted under OIML-CS. Regarding the quality systems required under OIML-CS, NMIJ is accredited based on ISO/IEC 17025 by IAJapan, NITE (National Institute of Technology and Evaluation) which is the national accreditation body. Regarding the conformity to ISO/IEC 17065, NMIJ is preparing for an accreditation by IAJapan.

To ensure energy supply by reducing CO_2 emission, the government promotes development of FCVs (Fuel Cell Vehicles). To assure reliable **measurement of hydrogen** at HRSs (Hydrogen Refueling Stations) for the consumers, a new national industrial standard, JIS B 8576 (measurement system of hydrogen-fuel) was published in 2016. For international coordination of technical requirements, Japan proposed an OIML project (TC8/SC7/p7) to revise **R 139** (compressed gaseous fuels measuring systems for vehicles) in 2016 as a co-convener. In 2018, its final draft was approved, and a new R 139 was published. The efficient achievement of this project was highly evaluated in OIML.

NMIJ is responsible for the secretariat of OIML **TC 8** (measurement of quantities of fluids) that is responsible for the nine publications. TC 8 is promoting two projects for revising R 63:1994 (petroleum tables) and R 119:1996 (pipe provers for testing of measuring systems for liquids). TC 8 proposed two 1st Committee Drafts of these documents in June 2019.

In **APLMF**, NMIJ provides an EC member, Dr. Matsumoto, from 2019. He also supports WG on Quality Measurement of Agricultural Products (QMAP) as the former chair as well as a WG member.

METI conducted a training program in cooperation with **AOTS** (Association for Overseas Technical Cooperation and Sustainable Partnerships) and NMIJ in 2017 and 2018. The last AOTS training course was held in the Tokyo area from 3rd to 14th in December 2018 with 14 participants from 14 Asian economies in the field of legal/scientific metrology. In addition to AOTS training, NMIJ also accepts trainees in scientific metrology from other NMIs attaining with their own fund.

SECTION 2 – Key activities of 2018/19

Working with industry

It is mentioned in “major projects”.

Protecting consumers

To ensure reliable measurements in transactions for the consumers, METI conducts a **post-market surveillance with trial purchase** of measuring instruments annually since 2013. Specified measuring instruments under the categories such as NAWI (non-automatic weighing instrument), clinical thermometer and sphygmomanometer are purchased at the market, and their performances are tested by NMIJ and other laboratories. Another instrument category Specified Measuring Instruments for Household Use[*1] is also selected as the target. This is a blind test and it is not informed to the manufacturers in advance. The test items are close to those of verification (not of type approval). In FY2017, a total of 50 types of NAWIs, bathroom scales and kitchen scales were tested. These results, including non-conformances, were reported on the website of METI (only in Japanese).

To promote awareness in metrology system, METI specified 1st November as the national **Metrology Day** to commemorate enforcement of the Measurement Act on 1st November 1993, and specified November as a special month for metrology. METI hosts a special event for Metrology Day on 1st November every year, and those who have contributed to metrology field are given “Minister of Economy, Trade and Industry Award” in this event.

METI hosts an event called “**Children’s Day**” in August every year, so that they get interested in METI’s works in a wide variety. This year, Metrology Policy Office (METI) provided a metrology-related

program in which children used scales and weights with support of NMIJ staffs. An exhibition of the new mass standard using a silicone sphere was also provided.

AIST's **Open Laboratory** intended for children is held in July every year. In this event, NMIJ holds an exhibition and provides experience-based programs regarding metrology.

**1 This is another category of instrument specified in Measurement Act which relies on a voluntary quality control by the manufacturer. Type approval and verification are not required to this category. Bathroom scales and kitchen scales are typical examples.*

Major projects - What we did and what we learned

In 2016, Measurement Administration Council provided proposals regarding practical implementation of Measurement Act in the future. Following these proposals, METI has been revising the **cabinet orders** and **ministerial ordinances** that support Measurement Act.

As the primary reformation, the requirements to be a verification body was mitigated. **Designated Verification Institutes** (DVI), which are mostly private non-profit bodies, are then allowed to conduct verifications (error tests) for the instrument categories of NAWI, AWI (automatic weighing instrument) and fuel dispensers. DVIs (mostly private organizations) need to pass an assessment by METI and their staff should attend a training course in NMIJ before providing services.

In addition, **AWIs** (automatic weighing instruments) are newly subject to the legal metrological control as one of the specified measuring instruments in order to respond to the increasing social needs for consumer protection as well as conformance to the OIML's technical requirements. In April **2019**, type approval and verification started for the category corresponds to OIML **R 51** (automatic catch-weighing instruments). Other categories correspond to **R 50** (continuous totalizing automatic weighing instruments), **R 61** (automatic gravimetric filling instruments) and **R 107** (discontinuous totalizing automatic weighing instruments) will gradually be subject to the legal metrological control by **2020**. The entire reformation on all target AWIs, including transition periods, will be completed in **2026**.

In this control scheme on AWIs, NMIJ conducts type approval and DVIs conduct verifications. NMIJ is preparing for the type approval on AWIs with setting up new test facilities. DVIs must be assessed and designated by METI before conducting verification, and some of their staffs should be trained in NMIJ.

New domestic standards of **JIS** (Japanese Industrial Standard), which correspond to OIML R 50, R 51, R 61 and R 107, are under publication as the technical requirements applied to the legal metrological control. Domestic stakeholders (central/local governments, verification bodies, manufactures and users) participate in this procedure.

Another important reformation is in progress to correspond the recent **redefinition** of the **four SI units** in CGPM. A ministerial ordinance specifying the measurement units to be used in metrology was revised in May 2019 and necessary amendments were added to the definitions of unit in the ordinance.

SECTION 3 – Future focus

New initiatives planned (next 1-2 years)

Present reformation mentioned in "major projects" will continue for several years.

Emerging issues – challenges and opportunities

None at present.