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Economy Report - 2020

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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.

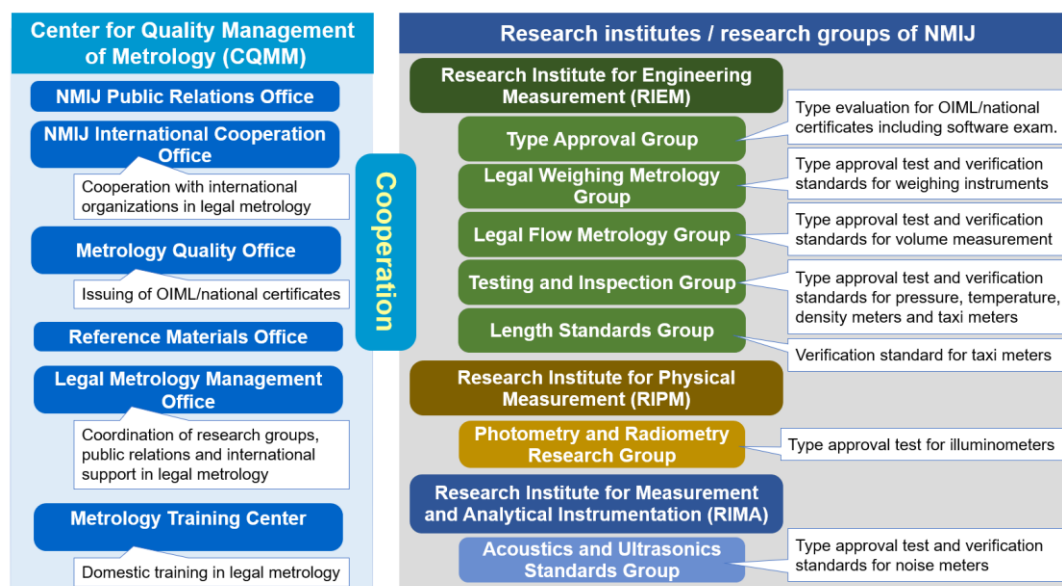


Figure 1 Structure of NMIJ

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

In October 2019, Dr. Yukinobu Miki of AIST received an **OIML Award**. He was the CIML member for 15 years and during which he also served as CIML Second Vice-President for 6 years (including one year of Acting First Vice-President). In October 2020, Dr. Toshiyuki Takatsuji of NMIJ took over the CIML member. At the 55th CIML meeting in 2020, Dr. Tsuyoshi Matsumoto, who supported Dr. Miki, received another OIML Award.

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.

NMIJ is responsible for the secretariat of OIML **TC 8** (measurement of quantities of fluids) that maintains the nine publications. TC 8 finished two projects for revising R 63:1994 (petroleum tables) and R 119:1996 (pipe provers for testing of measuring systems for liquids), and they will be published as two new OIML Documents in 2021.

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. In addition, NMIJ is preparing for issuing OIML certificates on R 117 (fuel dispensers). NMIJ envisages that this service would be started in 2021 after an assessment procedure. 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 and ISO/IEC 17065 by IAJapan, NITE (National Institute of Technology and Evaluation) which is the national accreditation body.

To ensure energy supply by reducing CO₂ emission, the government promotes development of FCVs (Fuel Cell Vehicles). To assure reliable measurement of hydrogen at HRSs (Hydrogen Refueling Stations) for the consumers, 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 revised R 139 was published. The efficient achievement of this project was highly evaluated in OIML and Dr. Takatsuji Received a letter of appreciation from OIML as the co-convener.

In APLMF, NMIJ provides an EC member, Dr. Matsumoto, from 2019. He also supports WG on Quality Measurement of Agricultural Products (QMAP) 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 two-week AOTS training course was held in the Tokyo area 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 2019/20

Working with industry

It is mentioned in “major projects”.

Protecting consumers

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. However, this event was cancelled for 2020 due to COVID-19 (see Emerging issues) although the awardees were selected.

Even in such a severe circumstance, some local verification institutes provided online events. For example, Tokyo Metropolitan Government Inspection Institute of Weights and Measures (TMII) provided E-Learning materials on its website in August 2020. They enabled children to visit the institute’s facilities virtually and to learn how to make a toy scale through an instruction video.

Major projects - What we did and what we learned

1. Revision of the legislation system supporting Measurement Act

In 2016, Measurement Administration Council made recommendations regarding practical implementation of Measurement Act in the future. Following these recommendations, METI revised

the **cabinet orders** and **ministerial ordinances** that support Measurement Act in the period from 2017 to 2020. The latest revision was added to the ministerial order No. 74 in September 2020. Based on these revisions, METI and NMIJ have conducted the following activities.

2. Introduction of Designated Verification Institutes (DVI)

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

3. New metrological control on automatic weighing instruments (AWIs)

In addition, **AWIs** 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 2023. The entire reformation on all target AWIs, including transition periods, will be completed in 2026.

4. Drafting of new JISs for AWIs

In 2018 and 2019, new domestic standards of **JIS** (Japanese Industrial Standard), which correspond to the OIML Recommendations, were published as the technical requirements applied to the legal metrological control on AWIs. They are namely JIS B 7603, JIS B 7604-1/2, JIS B 7606-1/2 and JIS B 7607 that correspond to OIML R 107, R 61, R 50 and R 51, respectively. Domestic stakeholders (central government, NMIJ, manufactures and representatives of users) participated in the drafting procedure of these JISs.

5. Type approval on AWIs by NMIJ

In this control scheme on AWIs, NMIJ conducts type approval and DVIs conduct verifications. NMIJ is advancing preparation toward the type approval on AWIs. In 2020, new testing facility for automatic catch-weighing instruments is developed on NMIJ's North Campus and type approval test has started. Regarding AWI, NMIJ currently issues only national type approval certificates on this instrument category.

SECTION 3 – Future focus

New initiatives planned (next 1-2 years)

Present reformation mentioned in “major projects” will continue for several years although there is a serious concern on COVID-19 as mentioned in the next clause.

Emerging issues – challenges and opportunities

This year, the impact of COVID-19 puts the entire world in serious danger and it is changing our lifestyles in behaviors such as communication, travel, meeting and discussing with people, and working at workplace. In the metrology system of Japan as well, necessary measures have been taken such as extension of the validity period of verifications and inspections in response to COVID-19. If this serious situation continues in the future, it might be necessary to consider a verification / inspection system suitable for a “new normal lifestyle” that avoids the Three Cs (closed spaces, crowded places and close-contact settings).