Economy Report - 2020

Republic of Korea

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SECTION 1 – Organisation and structure for metrology

Organisation Structures

Specialty	Scientific metrology	Legal metrology
Organization	Korea Research Institute of Standards and Science(KRISS)	Korean Agency for Technology and Standards(KATS)
Business unit	Measurement Standards Laboratory	Metrology & Measurement Division
Person in Charge	Dr. No Weon Kang	Dr. Wan Bin, Im
Location	Daejeon-si	Eumseong-gun, Chungcheongbuk-do

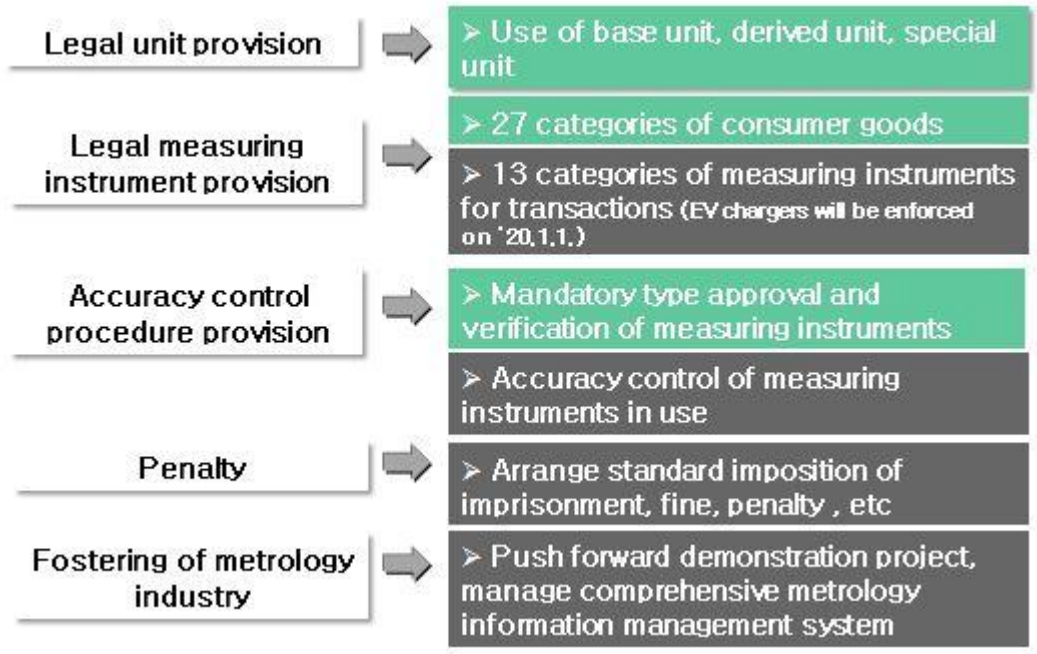
Relevant organizations

- Korea Testing Certification(KTC) – Type approval & verification of measuring devices
- Korea Testing Laboratory(KTL) – Type approval of electricity meters
- Korea Association of Standards & Testing Organizations(KASTO) – Association
- Ministry of Food and Drug Safety(MFDS) – Medical Devices

Legislative Frameworks

Measures Act 2018
Enforcement decree of the Measures Act 2019 (presidential decree)
Enforcement rule of the Measures Act 2020 (ordinance of the ministry of trade, industry and energy)

Main contents of Measures Act include the following:



23 regulations

- 11 technical regulations for testing 13 Measuring Instruments

- **non-automatic weighing instrument technical standard (*No. 2018-110)**
- **weights technical standard (*No. 2018-110)**
- **gas meter technical standard (*No. 2019-033)**
- **hot water meter technical standard (*No. 2018-110)**
- **water meter technical standard (*No. 2018-110)**
- **liquid meter technical standard (*No. 2018-109)**
- **graduated tank technical standard (*No. 2018-110)**
- **heat meter technical standard (*No. 2018-110)**
- **electricity meter technical standard (*No. 2018-206)**
- **urea water meter technical standard (*No. 2018-110)**
- **electric vehicle charger technical standard (*No. 2020-017)**

-12 by-laws for implementation of legal metrology

International arrangements and engagement

The 42nd Korea-Japan cooperation committee for Legal Metrology
(February 17 ~ February 18/ Tsukuba, Japan)

The 55th CIML meeting participation
(Oct. 20 ~ Oct. 22/Online)

OIML TC 12/P1 meeting participation
(Under Discussion)

The 4th Korea-China cooperation committee for Legal Metrology
(Postponed)

SECTION 2 – Key activities of 2019/20

Working with industry

Institutionalization of Smart Meters

Purpose

Since 2000, remote meter reading has been prevalent in Republic of Korea. However, technical regulation for measuring instruments only provides criteria for in-person meter reading despite the fact that remote reading is currently being conducted in the market. Due to COVID-19, untact transactions, such as remote meter reading, are expected to increase in the future. It becomes necessary to provide criteria and management system for remotely transmitted measurement data.

< Current measuring instruments vs. Smart meter type instruments >

<Mechanical Electricity Meter>

<Mechanical Gas Meter>

<Mechanical Water Meter >

<Mechanical Heat Meter>

<Smart Electricity Meter >

<Smart Gas Meter>

<Smart Water Meter>

<Smart Heat Meter>

Progress

In July 2017, Korea Smart Metering Forum (the "KSMF") was established. The forum has since continued to communicate with businesses in the field of legal metrology and energy operators. As of June 2020, 107 members joined the forum.

<International Seminar for Smart Metering
(2019.12, Joined by Korea/Germany/Italy, etc)>

"Measures for Smart Meter Institutionalization" was established in October 2019 suggesting institutionalization plan for establishing smart meter regulations, systemizing type approval/verification, and others. There is currently an ongoing research on smart meter evaluation guidelines for 5 types of measuring instruments for household use (electricity meter, gas meter, water meter, hot water meter and heat meter).

< Main Contents of Smart Meter Evaluation Guidelines >

- OIML D 31 General requirements for software controlled measuring instruments
- Communication protocol should comply with international standard and if it follows national standard, the content of said standard should be open to public
- Requirements regarding firmware update, battery capacity information, minimum meter reading period, etc

Future plan

Depending on the status of each measuring instrument, institutionalization will take place in phases: electricity meter technical regulation amendment (2021), gas meter technical regulation (to be determined), water meter technical regulation (to be determined)

"Smart meter evaluation guide" is limited to measuring instrument itself. Thus, to secure compatibility with other instruments such as modem/gateway/server and others that constitute smart metering system, standardization is planned to be done for cooperation with related businesses, organizations and associations.
Remote Verification is currently under review by OIML from 2020. The content will be adopted based on its review progress.

Protecting consumers

EV Charger Legal Metrology Control Enforcement

Progress

Since 2015, Republic of Korea commenced reviews on EV charger management necessity. In July 2016, technical regulation for electricity meter was initially modified to manage EV charger as a chargeable type electricity meter.

In May 2019, enforcement decree of measures act was amended to add EV chargers as a separate instrument type. In July 2019, "Technical regulation for EV charger" was established and from January 2020, Maximum permissible error of ±1% was applied.

DC fast charging technology advancement was reflected to expand DC current range from less than 500V to less than 1000V in February 2020 by amending the technical regulation. DC charger error range was eased from ±1% to ±2.5%.

Main content of EV charger technical regulation

- MPE(AC charger 1%, DC charger 2.5%)

- Limit error variation based on external influence such as temperature, current, voltage, electromagnetic wave and others
- Seal to prevent manipulation, requirement for software distinction, etc
- Re-verification period
  - Fixed type charger: 7 years
  - Portable charger: 4 years

Current Situation


<Fixed Type Charger>


<Portable Charger>


<Chargeable Socket-Outlet>

By September 2020, 30 models received type approval (AC: 22, DC: 8), 2400 chargers were verified. There are about 110,000 electric cars (as of June 2020) and about 30,000 chargers (as of August, 2020) in the market

For chargers supplied prior to legal enforcement, research will be conducted by the end of the year for error occurrence and supplementation measure is planned to be developed by way of verification and others.

Chargeable Socket-outlets that can charge EVs in an apartment parking lot and have a theft prevention function will be allowed in order to expand EV charger supply. (By the end of the year, formal regulation for chargeable socket outlet will be provided as a “Socket-outlet electricity meter”)

SECTION 3 – Future focus

New initiatives planned (next 1-2 years)

Establishment and Operation of Smart Measuring Instrument Distribution Management System

Background

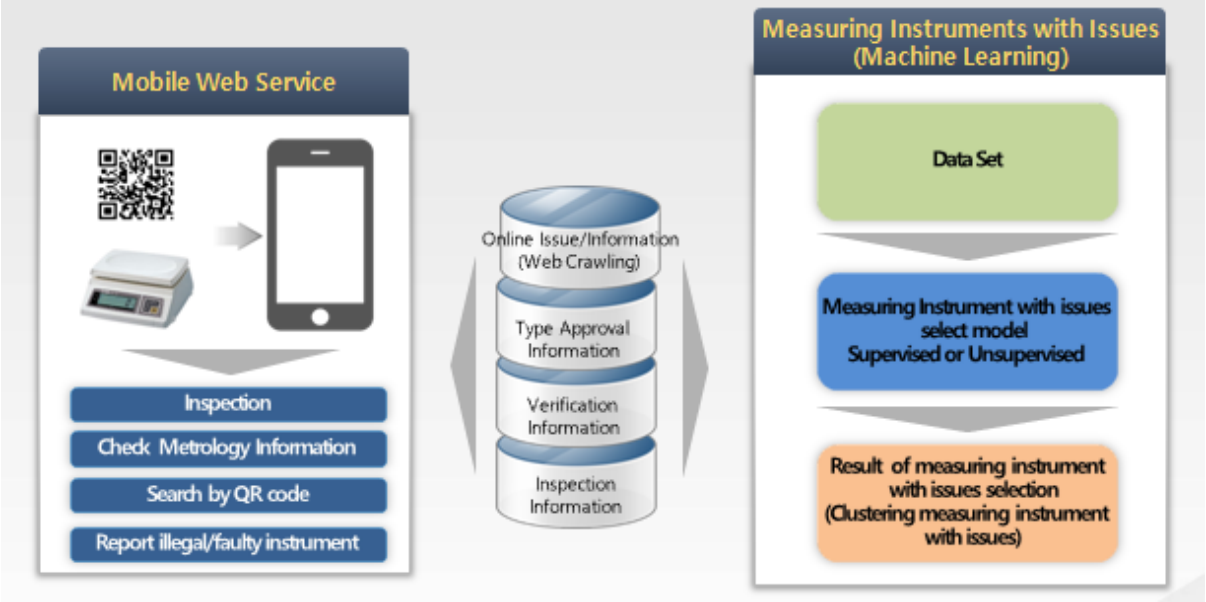
Per Measures Act, Korean Agency for Technology and Standards manages 13 types of legal measuring instruments. When measuring instruments are manufactured, type approval and verification are conducted as a form of initial management. When instruments are distributed or in-service, follow-up management including re-verification, regular periodic inspection, spot check, and in-service surveillance are conducted. Quality information gathered during these processes is managed by KATS.

With the gathered information, establishment of Smart Measuring Instrument Distribution Management System is underway to have a systemic and smart management structure. By operating such system, inspection can become more effective and by preparing inspection system for illegal measuring instrument, citizens can be protected from damage/loss. The system is expected to be established by the end of 2020.

Content

Market Surveillance Efficiency

In order to objectively select measuring instruments subject to market surveillance activity, the new system offers a service where measuring instruments that are potentially faulty or illegal are automatically selected. In addition, in order to effectively search necessary information, conduct inspection and process report, mobile web service and search function by way of QR code are provided.



<System for Market Surveillance Efficiency >

Monitoring Measuring Instrument Sold Online

Korean Agency for Technology and Standards

By collecting information on measuring instruments sold online and creating a platform that enables detection of instruments when they are uploaded on the website for sale, the new service offers automatic analysis of illegal or faulty measuring instruments.

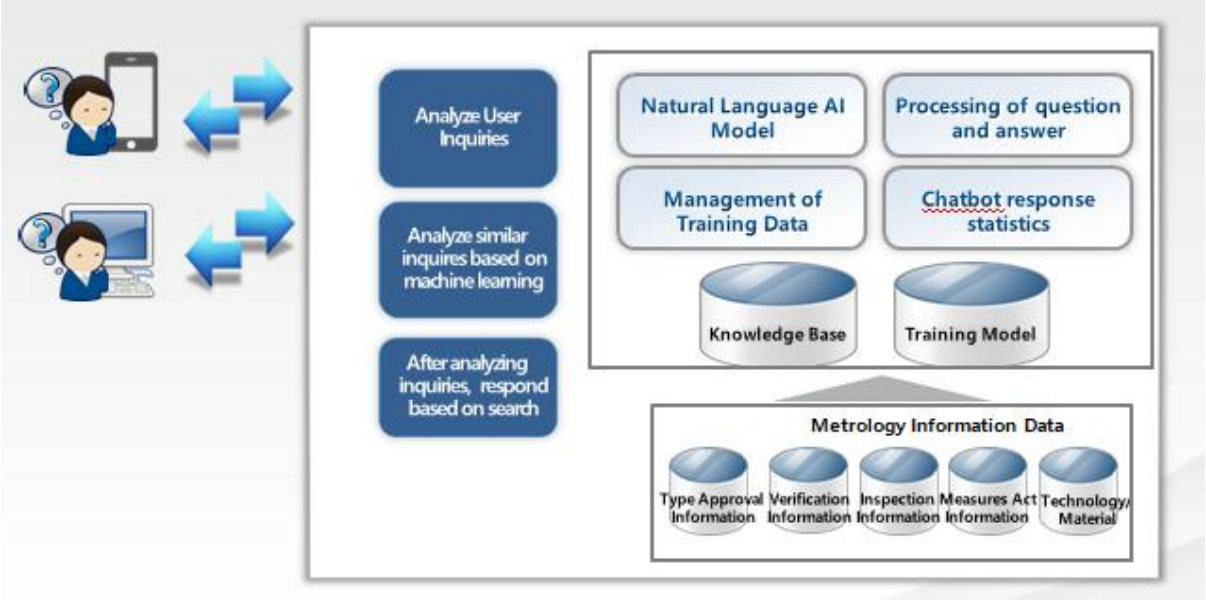
Metrology Information Analysis Service

Expand organization response

Places where metrology information is collected from are expanded to include autonomous businesses and information gathered from these businesses is connected to the system. By doing so, the system provides combined analysis and prediction service

Chat-bot Service

As demand for information comes from various sources, including consumers, businesses, organizations and others and as information requested differ by source, the new system provides a Chatbot service that offers custom and automatic responses. The service is offered 24hours a day.



Expected Outcome

Increase in work efficiency

- Objective selection of surveillance subject by predicting Illegal measuring instruments and instruments with issues automatically, timely response and policy establishment support
- Management of information on smart phones to relieve overlap/duplicate work at the inspection site
- Guarantee right to know and expand channel for participation for consumers by being able to check and report measuring instruments on site

Preparation of online distribution market surveillance system

- Elimination of blind spot for management and improvement of efficiency by creating surveillance system for measuring instruments sold online by transitioning from manual to large scale automatic market surveillance system.
- Prevention of consumer damage/loss and increase in law abiding spirits of sellers by conducting surveillance on measuring instruments sold online. When measuring instruments are uploaded on the website for sale, illegality of measuring instrument is checked ahead of time

Improvement of Quality Management and Provision of High Quality information Through Integrated Analysis

- Quick responses to industry changes by analyzing and predicting overall metrology industry
- Promotion of increase in product quality and strengthening of businesses' competitiveness by providing high quality metrology information
- Understanding of general metrology industry and support of government policy in the future with combined management of information from autonomous businesses, type approval and verification bodies and local governments, while guaranteeing each organization's autonomous management system
- Response to expansion of industry in the future by establishing a platform that can respond to expansion of autonomous businesses and type approval and verification bodies.

Improvement of Consumer Satisfaction Based on Automation of Complaint Response

- Convenience for consumers to search information by providing automatic complaint response
- Decrease in labour cost by reducing complaint response personnel
- Access to information for consumers anytime, anywhere as high quality information is provided at all times.

After 2 months of testing period (January and February of 2021), the system will be in service from March 2021.