BIPM Liaison Report to
to the WTO TBT Committee

May 2020
THE VISION, MISSION AND OBJECTIVES OF THE BIPM

The BIPM is an intergovernmental organization established by the Metre Convention, through which Member States act together on matters related to measurement science and measurement standards.

Its vision is to be universally recognised as the world focus for the international system of measurement.

Its mission is to work with the NMIs of its Member States, the RMOs and strategic partners world-wide and to use its international and impartial status to promote and advance the global comparability of measurements for:

- Scientific discovery and innovation,
- Industrial manufacturing and international trade,
- Improving the quality of life and sustaining the global environment.

The objectives of the BIPM are

- To represent the world-wide measurement community, aiming to maximize its uptake and impact.
- To be a centre for scientific and technical collaboration between Member States, providing capabilities for international measurement comparisons on a shared-cost basis.
- To be the coordinator of the world-wide measurement system, ensuring it gives comparable and internationally accepted measurement results.

Fulfilling the BIPM mission and objectives is complemented by its work in:

- capacity building, which aims to achieve a global balance between the metrology capabilities in Member States;
- knowledge transfer, which ensures that the work of the BIPM has the greatest impact.

The objectives of the BIPM were confirmed by Resolution 3 adopted by the General Conference on Weights and Measures (CGPM) at its 26th meeting held in Versailles, France on 13-16 November 2018.

The presentations and outcomes of this meeting are available on the BIPM website, https://www.bipm.org/en/cgpm-2018/

Responding to Covid-19

Following instructions issued by the French Government regarding the COVID-19 outbreak, the BIPM laboratories are temporarily closed (except for essential maintenance, and a limited number of mission-critical interventions), though plans are advanced to reopen shortly with sparse working and supporting protocols. The world timescale and the BIPM databases are being operated as per normal. Laboratory staff are currently fully occupied with report writing, data analysis and other associated tasks that can be carried out remotely. The publicly provided databases continue to be supported and fully operating, including the system for reviewing calibration and measurement capabilities. Other functions, including that of international liaison and the organizational support functions, are all being conducted via teleworking, with on-site presence again limited to that which is mission-critical. Contacts with BIPM staff continue through emails and telephone.

SI

Starting from March 2020, the Time Department is providing additional graphical information concerning the use of Primary and Secondary Frequency Standards (PSFS) in UTC. A graphical representation of all evaluations of PSFS reported since Circular T 190 (October 2003) is given here: https://webtai.bipm.org/database/show_psfs.html.

The plot will report the measurements carried out using PSFS and which are used for the steering of TAI. This information, updated every month, will help to evaluate the impact of PSFS in UTC, in view of a possible redefinition of the second.

According to the roadmap towards a redefinition of the SI second (CCTF 2016); a regular contribution to TAI by the new frequency standards is considered one of the criteria for a new definition of the second.

THE CIPM

The II session of the 108th meeting of the CIPM was held on 15-16 October 2019. The report of the 108th meeting of the CIPM (Session II, October 2019) is now available on the BIPM website in English. All CIPM Decisions are available on the BIPM webpages.
BIPM LIAISON AND COORDINATION WORK

Liaison with Member States and Associates of the CGPM

As of January 2020 the BIPM had 62 Member States, and 40 Associate States and Economies of the CGPM.

The Republic of Belarus became a Member State as from 13 January 2020, after having been an Associate State of the CGPM for more than fifteen years.

The list of Member States and Associates of the CGPM is given in Annex.

Liaison with international organizations

The BIPM has a series of ongoing institutional and technical interaction with over 30 international organizations and international bodies.

The BIPM works with its liaisons through a wide range of forums, including the quadrupartite arrangement with the International Organization for Standardization (ISO), the International Laboratory Accreditation Cooperation (ILAC) and the International Organization of Legal Metrology (OIML) as well as via joint working groups (WGs) created by the International Committee for Weights and Measures (CGPM), as well as through joint committees, for example Joint Committee for Guides in Metrology (JCGM).

The OECD/BIPM joint study: The Case of the International Bureau of Weights and Measures, describing the operation of the BIPM was published on 6 February 2020 within the OECD initiative "Partnership of international organizations for effective international rule-making" (IO Partnership). This study is complementary to a series of the OECD studies of rule-making practices of selected IOs developed during 2014-2016 for FAO, IMO, ISO, OECD, OIML, UNECE, WHO, in 2019 for WTO and in 2020 for OIE. The BIPM continues contributing to the work of IO Partnership by participating in its Working Groups as well as a co-focal point of the Working Group 5 on Coordination among IOs.

Each year on 20 May, the world-wide metrology community celebrates World Metrology Day – the day of signing of the Metre Convention in 1875. The project is run jointly by the BIPM and the OIML. The theme this year is “Measurements for global trade”. This theme was chosen to create awareness of the important role measurement plays in facilitating fair global trade, ensuring products meet standards and regulations, and satisfying customer quality expectations. Indeed more widely metrology, the science of measurement, plays a central role in scientific discovery and innovation, industrial manufacturing and international trade, in improving the quality of life and in protecting the global environment. The 2020 poster was designed in collaboration with the AFRIMETS RMO and specifically with AA&W Legal Metrology Egypt. The translation of the poster into many languages and national celebration events are expected. 2020 World Metrology Day Resource Website is http://www.worldmetrologyday.org/.

On the resource website, the Press Release, the Directors’ Message and the poster may be downloaded.

The International Atomic Energy Agency (IAEA) and the World Health Organization (WHO) co-ordinate a network of Secondary Standards Dosimetry Laboratories (SSDLs), designated by IAEA Member States. The IAEA’s Dosimetry Laboratory operates as the central laboratory in the SSDL Network and provides calibrations, reference irradiations, comparison programmes and dosimetry audit services for Member States. The aim of the SSDL Network is to improve accuracy in radiation measurements for cancer therapy; for many countries, the IAEA/WHO Network is the route for traceability to the SI for national dosimetry standards. A Scientific Committee of seven international experts, which includes a representative of the BIPM, meets biennially to advise the Directors General of the IAEA and the WHO regarding the programme of the IAEA/WHO SSDL Network and the activities of the Dosimetry and Medical Radiation Physics Section. A meeting of the Scientific Committee was held in March 2020 to discuss recommendations for future work, covering issues such as the use of the new accelerator facility, knowledge-transfer opportunities, the streamlining of calibration services, and database management. The recommendations will be published in the SSDL Newsletter later this year.

A multi-year project involving multiple institutions and coordinated by the IAEA has culminated in a paper published in the journal Physics in Medicine & Biology. The paper, co-authored by a BIPM staff member, provides definitive values for the critical correction factors kQ that enter in the determination of the...
radiotherapy dose to cancer patients. The new values are derived from a combination of experiment and state-of-the-art Monte Carlo calculations at numerous NMIs and other institutes and have an uncertainty almost a factor of two better than the values currently recommended. They will be incorporated into the IAEA Code of Practice (TRS-398) used by clinicians when evaluating the dose output from their treatment machines. This Code of Practice is currently being revised by a small working group with BIPM participation.

CIPM MRA and KCDB

The CIPM MRA is the ‘Mutual Recognition Arrangement of National Measurement standards and of calibration and measurement certificates issued by National Metrology Institutes’. Participation in the CIPM MRA continues to grow: it has been signed by representatives of 102 institutes – from 62 Member States, 40 Associates of the CGPM (Morocco is the latest signatory), and four international organizations – and covers a further 153 institutes designated by the signatory bodies.

A significant milestone was achieved for the BIPM and the KCDB 2.0 on 2 April 2020 with the publication of a CMC for gravimetry from CENAM (Mexico). This represents the first CMC that has been submitted, reviewed and approved entirely using the new KCDB web platform (KCDB 2.0). Whilst the BIPM has published many sets of CMCs in March 2020 (and continues to do so), they were sets that had been reviewed using the old JCRB web facility, and post-processed by the KCDB Office for publication on the new platform. This first publication clearly demonstrates the potential of the new system. The CMC was created and submitted for intra-regional review on 26 February 2020. Having completed the SIM review and being subjected to inter-regional review, it was approved and published just five weeks later on the KCDB on 2 April 2020.

As of April 2020, the BIPM key comparison database (KCDB) included a total of 25,507 Calibration and Measurement Capabilities (CMCs):

- 1256 in Acoustics, Ultrasound, Vibration,
- 4391 in Electricity and Magnetism,
- 1624 in Length,
- 2800 in Mass and related quantities,
- 1419 in Photometry and Radiometry,
- 6 632 in Chemistry,
- 3854 in Ionizing Radiation,
- 2728 in Thermometry,
- 803 in Time and Frequency.

1057 key comparisons and 600 supplementary comparisons registered in the KCDB.

CAPACITY BUILDING and KNOWLEDGE TRANSFER (BIPM CBKT) PROGRAMME

The BIPM launched a new Capacity Building and Knowledge Transfer Programme (BIPM CBKT Programme) in 2016 aimed at countries and economies with emerging metrology systems (CEEMS).

The aim of the BIPM CBKT programme is to increase the effectiveness with which Member States and Associates engage in the world-wide coordinated metrological system.

The CBKT programme has become a great success in a short space of time, with a number of successful projects being held so far.

The programme is wholly supported by sponsors. So far 500 participants from 93 countries, covering all six RMOs, have benefited from the CBKT initiatives. At the time of writing, over 75 % of Member States and Associates have participated in the CBKT Programme (as trainees, lecturers and sponsors).

The CBKT courses were organized recently to equip those who operate the CIPM MRA CMC review processes with the appropriate skill-set and information to use the KCDB 2.0 as efficiently as possible.

A number of BIPM CBKT projects are under development and support from sponsors is always welcomed. Full details are available at:

http://www.bipm.org/en/cbkt/

BIPM ANNUAL REVIEW and WORK PROGRAMME

The BIPM Annual Review 2018/2019 is available online.

The draft BIPM Work Programme 2020-2023 (near final version) is publicly available on the BIPM website:

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