

International Committee  
for Weights and Measures

**Proceedings of Session I  
of the 110th meeting**

(21-23 June 2021)

## Executive Summary

### Session I of the 110th meeting of the CIPM (21-23 June 2021)

#### **Covid-19 pandemic response**

The effect of the ongoing Covid-19 pandemic on the BIPM and the positive way that it has responded to the challenges was a recurring theme throughout the meeting.

#### **New Member State and Associate**

The Republic of Estonia became a Member State on 19 January 2021 and The Kingdom of Cambodia became an Associate on 1 January 2021.

#### **Communications projects**

A number of major communications projects have been completed by the BIPM since the last meeting of the CIPM. These include the new BIPM website and the BIPM e-Learning platform.

#### **Digital transformation**

Digital transformation projects are under way, including completion of the Application Programming Interface (API) for the KCDB 2.0 and the preparation of a digital version of the 9th edition of the SI brochure.

#### **CIPM Strategy**

Significant progress has been made towards the development of the CIPM Strategy, including the establishment of a Sectorial Task Group on Climate Change and Environment, as proposed by the Sub-Committee on Strategy SC1.

#### **Approval of the audited financial statements of the BIPM and the BIPM Pension and Provident Fund**

The CIPM confirmed its approval of the audited financial statements of the BIPM and of the BIPM Pension and Provident Fund. The CIPM granted the BIPM Director quietus for the 2020 exercise.

#### **GULFMET**

The CIPM decided to admit the regional metrology organization GULFMET as a full member of the JCRB.

#### **27th meeting of the CGPM (2022)**

The dates for the 27th meeting of the CGPM have been proposed as 14-18 November 2022 at the Palais des Congrès de Versailles. The format of the meeting (physical, hybrid or online) is to be confirmed.

**MEMBERS OF THE  
INTERNATIONAL COMMITTEE FOR WEIGHTS AND MEASURES**

As of 21 June 2021

**President**

W. Louw, South Africa.

**Secretary**

T. Usuda, Japan.

**Members**

F. Bulygin, Russian Federation.

D. del Campo Maldonado, Spain.

I. Castelazo, Mexico.

N. Dimarcq, France.

Y. Duan, China.

H. Laiz, Argentina.

T. Liew, Singapore.

P. Neyezhnikov, Ukraine.

J. Olthoff, United States of America. *CIPM Vice-President.*

S.-R. Park, Republic of Korea.

M.L. Rastello, Italy.

P. Richard, Switzerland.

G. Rietveld, the Netherlands.

M. Sené, United Kingdom.

A. Steele, Canada.

J. Ullrich, Germany. *CIPM Vice-President.*

**Honorary members**

W.R. Blevin, Australia.

L.M. Branscomb, United States of America.

E.O. Göbel, Germany.

B. Inglis, Australia.

K. Iizuka, Japan.

R. Kaarls, the Netherlands.

J. Skákala, Slovakia.

## Agenda

1. Opening of the meeting and approval of the agenda
2. Confirmation of the report of the 109th meeting and review of the decisions taken
3. Secretary's report (including recall of decisions taken by correspondence)
4. Director's update
5. Update from the President on the development of the CIPM Strategy
  - Proposal for Sectorial Task Group on Climate Change and Environment
6. Reports from the CC Presidents (reports were invited from those CCs that had met since the last session of the CIPM)
7. Finance
  - Report from the CIPM Sub-Committee on Finance
  - Update on payments received and spend to date
8. Report from the BIPM on progress with the 2020-2023 Work Programme
9. Strategy for the BIPM and timetable for the preparation of the Work Programme (2024-2027)
10. Plans for the 27th meeting of the CGPM
11. Update from the JCRB
  - JCRB Recommendation 43/1 on the status of GULFMET as an RMO
12. Update from the CIPM President on the work of the *ad hoc* Working group of Member State Representatives
13. Other business
14. Dates and format for the CIPM meetings in 2021 and 2022
  - Meeting format in October 2021
  - Plans by APMP for the NMI Directors' meeting

**1. OPENING OF THE SESSION;  
QUORUM;  
AGENDA**

The International Committee for Weights and Measures (CIPM) held Session I of its 110th meeting on Monday 21 to Wednesday 23 June 2021 online.

Present: F. Bulygin, D. del Campo Maldonado, I. Castelazo, N. Dimarcq, Y. Duan, H. Laiz, T. Liew, W. Louw, M.J.T. Milton (Director of the BIPM), P. Neyezhnikov, J. Olthoff, S.-R. Park, M.L. Rastello, P. Richard, G. Rietveld, M. Sené, A. Steele, J. Ullrich and T. Usuda.

Also attending the meeting were: C. Fellag Ariouet (Personal Assistant to the Director and Head of the Executive and Meetings Office), C. Planche (Librarian and Drafting Officer) and R. Sitton (Publications Officer).

The following were in attendance for parts of the meeting: H. Fang (Executive Secretary of the CCM), A. Henson (Director of the International Liaison and Communication Department), S. Judge (Director of the Ionizing Radiation Department and Executive Secretary of the CCRI), S. Picard (KCDB Coordinator and Executive Secretary of the CCT), M. Stock (Director of the Physical Metrology Department and Executive Secretary of the CCEM and CCU), P. Tavella (Director of the Time Department and Executive Secretary of the CCTF) and R. Wielgosz (Director of the Chemistry Department and Executive Secretary of the CCQM).

With 18 members online at the start of the meeting the quorum was satisfied according to Article 12 of the Regulations annexed to the Metre Convention.

Dr Louw, the CIPM President, asked if there were any changes or additions to the draft agenda. There were no changes, and the agenda was adopted.

**2. CONFIRMATION OF THE REPORT OF THE 109TH MEETING AND REVIEW OF THE DECISIONS TAKEN**

The minutes of the 109th meeting (2020) had been circulated to the CIPM for comment and the latest version, with comments incorporated, had been available on the CIPM members' working area of the BIPM website in advance of the meeting (see document [CIPM/2021-02.01](#)). The CIPM was asked for acceptance of the minutes as a true record.

<b>Decision CIPM/110-01</b> The CIPM accepted the minutes of the 109th meeting of the CIPM as a true record.
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Dr Usuda, the CIPM Secretary, presented the decisions from the 109th meeting for noting (see document [CIPM/2021-02.02](#)).

**3. SECRETARY'S REPORT (INCLUDING RECALL OF DECISIONS TAKEN BY CORRESPONDENCE)**

Dr Usuda, the CIPM Secretary, recalled that a Quality Management System Review meeting had been held online on 19 April 2021. The meeting report, available as document [CIPM/2021-03.02](#), was noted.

The Secretary reported that the CIPM had made eight decisions by correspondence since its last meeting in October 2020. These decisions were noted by the CIPM (see below and document [CIPM/2021-03.01](#)).

**Decision CIPM/110-02** The CIPM noted the decision taken by correspondence on 30 October 2020 to submit a vote to the JCGM “in favour” of the publication of GUM 6 (Guide to the expression of uncertainty in measurement - Developing and using measurement models). The decision was supported unanimously.

**Decision CIPM/110-03** The CIPM noted the decision taken by correspondence on 18 November 2020 to conclude an MoU between the BIPM and the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) based on the draft circulated. Fifteen members voted in favour and three voted against.

**Decision CIPM/110-04** The CIPM noted the decision taken by correspondence on 17 December 2020 that the budget for 2020 should be changed as follows: site investment should be reduced by 193 k€ and the budget for laboratory investment should be increased by the same amount. Fourteen members voted in favour and one voted against.

**Decision CIPM/110-05** The CIPM noted the decision taken by correspondence on 17 December 2020 that the budget for 2021 should follow the budget presented to the 26th meeting of the CGPM (2018). Fifteen members voted in favour.

**Decision CIPM/110-06** The CIPM noted the following decision taken by correspondence on 30 April 2021. “Pursuant to Decision CIPM/108-34 of October 2019 the CIPM confirms, on the basis of the review by the CIPM Sub-Committee on Finance, that the data for the accumulated arrears and associated advances prepared by the BIPM staff are complete and satisfactory”. Eighteen members voted in favour.

**Decision CIPM/110-07** The CIPM noted the following decision taken by correspondence on 30 April 2021. “Pursuant to Decision CIPM/108-33 of October 2019 the CIPM instructs the BIPM staff to inform the States that have previously been notified of accumulated arrears exceeding the six-year period, of their financial situation”. Eighteen members voted in favour.

**Decision CIPM/110-08** The CIPM noted the following decision taken by correspondence on 30 April 2021. “The CIPM approves the first edition of the CIPM Rules of Procedure and thanks Dr Richard for his work in developing and consulting on it. The CIPM requests the BIPM Secretariat to publish the CIPM Rules of Procedure and to update the Compendium accordingly”. Seventeen members voted in favour and one against.

**Decision CIPM/110-09** The CIPM noted the decision taken by correspondence on 30 April 2021 that NRC (Canada) should be a member of the CCRI. Eighteen members voted in favour.

#### 4. DIRECTOR’S UPDATE

##### Membership

The Director recalled that the Republic of Estonia became a Member State on 19 January 2021, previously having been an Associate State of the CGPM since 27 January 2005. The Kingdom of Cambodia became an Associate on 1 January 2021. This brought the total number of Member States to 63 and Associates to 39.

## Communications projects

A number of communications projects have been completed by the BIPM since the last meeting of the CIPM. The BIPM e-Learning platform was launched in early 2021. This project is in the Work Programme 2020-2023 and was brought forward as a result of the Covid-19 pandemic. The platform uses dedicated e-learning software and is accessible through the BIPM website. The platform is particularly important for capacity building activities and is opening new opportunities for knowledge transfer in the laboratories, for example the Chemistry Department course on “impurity content in organic pure materials”.

The BIPM YouTube channel (<https://www.youtube.com/channel/UC9ROltu1--gjcrk5ZcWbHVQ>) has become an important communication vehicle for the organization, particularly with the number of activities that take place online. Three sets of videos were highlighted by the Director:

- The “The International System of Units (SI) in FAIR digital data” workshop, which took place on 22-26 February 2021, and attracted over 600 participants.
- The Joint Committee for Traceability in Laboratory Medicine (JCTLM) developed a suite of videos on measurements in laboratory medicine to celebrate World Metrology Day 2021. These videos have been viewed more than 2000 times since they were uploaded on 20 May 2021.
- The joint BIPM/ILAC knowledge transfer webinar on “Mining KCDB 2.0 in the context of accreditation” on 21 January 2021. This webinar was run as two sessions to cover all time zones and had more than 600 participants.

The Director added that the Consultative Committee for Ionizing Radiation (CCRI), Consultative Committee for Amount of Substance: Metrology in Chemistry and Biology (CCQM) and Consultative Committee for Thermometry (CCT) have developed their own series of webinars, which are all available on the YouTube channel. The other CCs were encouraged to follow this example as it is an effective method of communicating with a wide audience.

The new BIPM website has been launched and the Director thanked Dr Miles, in her role as BIPM Webmaster, for bringing this project to completion. In addition, the KCDB 2.0 is now fully operational and the ‘old’ KCDB has been closed. Training material is available on the YouTube channel and positive feedback has been received on the new functionalities available in the KCDB 2.0.

## Digital transformation

The Director said that the Application Programming Interface (API) for the KCDB 2.0 was launched on 21 June 2021, following beta testing by several NMI scientists. The API is accessible through the KCDB page of the BIPM website and a manual is available explaining how it can be used by software developers. This is a first step to demonstrate how metrology information can be made available to support the objective of providing digital calibration certificates that are based on traceability within the context of the CIPM MRA.

The Time Department has developed an API, which is currently at the beta testing stage, that will facilitate machine-readability for its database. Positive feedback has already been received from several NMIs.

The Consultative Committee for Length (CCL) is working on making the wavelength and frequency data from the CCL and Consultative Committee for Time and Frequency (CCTF) definitions available in a machine-readable format. A survey carried out by the CCL found that 76 % of its community would use an API service that can access the wavelength data available on the BIPM website. A task group will be established to collaborate with the CCTF to develop this service.



The BIPM has made significant progress with the preparation of a digital version of the 9th edition of the SI brochure. The file uses XML and UnitsML to represent units. Final editorial checks are now being undertaken to ensure that the text in the PDF generated from the file is identical to the existing PDF. The next step will be to include machine-readable information in the XML version of the SI brochure, for example the definitions of units.

The Director said that work on the digital transformation requires staff engagement across the BIPM: Dr Picard led the work on the KCDB API; Dr Stock has collaborated with an external contractor to develop the first XML version of the SI brochure; two scientists in the Time Department launched its API service; a scientist in the Ionizing Radiation Department has developed a new database; and the Chemistry Department has identified a secondee to work on its database.

The next steps in the digital transformation will require internal coordination within the BIPM. Dr Picard has agreed to expand her role to become BIPM Database Coordinator. Dr Picard will chair an internal liaison group to ensure that best practice is shared. A Database Technician will be recruited to work with Dr Picard. Dr Miles will collaborate with Dr Stock to develop further digital content within the XML version of the 9th edition of the SI brochure.

### Staff news

Dr Judge, the Director of the Ionizing Radiation Department, will retire at the end of June 2021. Dr Vincent Gressier from the *Institut de Radioprotection et de Sûreté Nucléaire* (ISRN) has been recruited to replace him and will start in August 2021. An existing scientist from the department will act as the Director of the Ionizing Radiation Department in the interim period.

Dr Bergstrand, RISE (Sweden), extended his two-year secondment as Executive Secretary of the Joint Committee of the Regional Metrology Organizations and the BIPM (JCRB) until July 2021. Dr Olav Werhahn, PTB (Germany), has been appointed and will take over the role of JCRB Executive Secretary from July.

The Director notified the CIPM that Mr Henson, Director of the International Liaison and Communication Department, will reach the statutory retirement age at the end of February 2022 and requested CIPM approval to extend Mr Henson's service, pursuant to Rule 4.2 of the RRI, by one year to the end of February 2023. Following a short discussion, the CIPM agreed unanimously to this request.

Mr Keochakian left the BIPM in December 2020 and his responsibilities in quality, health and safety have been redistributed among the BIPM staff. Additional training is being provided as necessary.

### *Circular T*

The Director recalled that the Time Department achieved the milestone of publishing the 400th edition of *Circular T* in April 2021. The BIPM took over responsibility for calculating UTC from the *Bureau International de l'Heure* (BIH) in 1988. Since 1988, the accuracy of UTC has improved from  $10^{-13}$  to  $10^{-16}$  and the number of laboratories that supply data for the calculation of UTC has increased to 90.

The President thanked the Director and invited questions. The Director was asked to give the CIPM an update on how the BIPM has reacted to the Covid-19 pandemic in terms of staff issues and the return to work as restrictions are gradually lifted. The Director replied that the only period of site closure mandated by the French Government was for eight weeks during March-May 2020. Since that time, the Government has required strict social distancing measures on site and for teleworking to be maximized. These measures are scheduled to end on 1 September 2021. All on site measures have been agreed and implemented by Department Directors and Heads of Section. Each member of staff agreed a personal schedule for telework and laboratory or office

occupancy and a special allocation of single offices was granted to those staff with limited space to telework at home. Department Directors and Heads of Section maintained contact with all staff that were teleworking via WhatsApp and Teams. In addition, regular emails were sent to staff to keep them up to date with changes in French Government guidelines. The Director recalled that changes made by the CIPM to the RRI in October 2020 anticipated the demand for increased teleworking by allowing two days per week.

The Director said that the rules in France relating to private health data are very strict and therefore information on the number of Covid-19 cases is not available. However, the situation at the BIPM probably reflected the situation in France as a whole. Dr Usuda, in his role as Secretary, recalled that he had seen during the Quality Management System review that all essential work at the BIPM had continued during the pandemic.

## 5. UPDATE FROM THE PRESIDENT ON THE DEVELOPMENT OF THE CIPM STRATEGY

The President thanked the CIPM for the work that has been carried out towards the development of the strategy, among others by the Sub-Committee on Strategy (SC1 Responding to Evolving needs for Metrology and SC2 Addressing Key Scientific Challenges). He noted that he had participated in the work of SC1 and SC2 and that the other Sub-Committees had already completed most of their work. The President said that he will prepare a first draft summary of the overall CIPM strategy document after the meeting; the draft will be circulated to CIPM members before it is finalized. It is anticipated that the overall strategy document will be finalized for approval at the next session of the CIPM in October 2021. The President asked Prof. Rietveld to provide an update on the work of SC1 and the status of the strategy document.

Prof. Rietveld referred to document [CIPM/2020-05.04](#) “*CIPM Strategy SC1 “Evolving Needs in Metrology” – Presentation*”. He said that the main output of SC1 is currently a discussion document, which gives a summary description of the seven ‘metrology grand challenges’ (document [CIPM/2020-05.01](#)). Proposals have been developed for the overall role of the CIPM as well as actions to support and stimulate international coordination in these areas including the possible impact on the BIPM work programme. A proposal for a potential CGPM resolution has been drafted. In addition to document [CIPM/2020-05.04](#), three other working documents were made available on the CIPM members’ working area of the BIPM website in advance of the meeting: [CIPM/2020-05.01](#) “*CIPM Strategy 2030+: responding to evolving needs in metrology (version 0.6, June 2021)*”; [CIPM/2020-05.02](#) “*Draft Resolution A On the Implementation of the Strategy developed by the International Committee on the “Evolving Needs in Metrology”*”; and [CIPM/2020-05.03](#) “*Suggestion for implementation of CIPM sectorial task groups*”.

Prof. Rietveld presented the themes for the seven metrology grand challenges and the associated contributions from the CIPM and BIPM for each theme. He said that the draft document “*CIPM Strategy 2030+: responding to evolving needs in metrology*” had been shared with the CCs. This had resulted in several useful comments and some updates to the document. In addition, the text on implementation of the focus groups had been extended, following discussion within SC1. There was a brief discussion on whether to publish the complete strategy document (with annexes) or only the main summary part. It was agreed that this will be decided by correspondence after the meeting.

Prof. Rietveld recalled the content of document [CIPM/2020-05.03](#), which recommends that the CIPM establishes a series of sectorial task groups as forums for discussion of the identified ‘metrology grand challenges’ and suggests an implementation plan for the task groups. He noted that a “*Draft Resolution A On the Implementation of the Strategy developed by the International Committee on the “Evolving Needs in Metrology”*” ([CIPM/2020-05.02](#)) had been prepared, but this did not require any action from the CIPM at the current meeting.

The President thanked Prof. Rietveld and reiterated that these documents are available on the CIPM members' working area of the BIPM website and that discussions and comments can continue by correspondence.

### **Proposal for Sectorial Task Group on Climate Change and Environment**

Prof. Rietveld said that SC1 proposes that a Sectorial Task Group on Climate Change and Environment should be established as soon as possible (see document [CIPM/2020-05.03](#)). This will allow the concept of the sectorial task groups to be trialled. It was suggested by Dr Steele that the Group should be active in time to contribute to the 26th United Nations Climate Change Conference of the Parties (COP26) in November 2021 as well as preparing for a workshop planned for October or November 2022.

The President thanked Prof. Rietveld and recalled that the CIPM had already established the CIPM Task Group on the Digital SI (CIPM-TG-DSI). He asked the CIPM for approval to establish the Sectorial Task Group on Climate Change and Environment, as outlined in document CIPM/2020-05.03. The CIPM approved the proposal and the following decision was agreed.

**Decision CIPM/110-10** The CIPM decided to establish a Sectorial Task Group on Climate Change and Environment, as proposed by the Sub-Committee on Strategy SC1: Responding to Evolving needs for Metrology.

Dr del Campo, Dr Sené and Dr Duan were appointed as the founding members to start the group. They were encouraged to build further momentum by seeking appropriate external expert collaborations and to promote the benefits of the work of the international metrology community with the parties at future United Nations Climate Change Conferences (known as COP).

## **6. REPORTS FROM THE CC PRESIDENTS (REPORTS WERE INVITED FROM THOSE CCs THAT HAD MET SINCE THE LAST SESSION OF THE CIPM)**

### **CCTF**

Dr Dimarcq presented report ([CIPM/2021-06.01](#)) and recalled that the CCTF is focusing on four 'hot topics' for which task groups had been created in 2020 under the coordination of the CCTF Working Group on Strategic Planning (CCTF-WGSP). The hot topics are: updating the roadmap for the redefinition of second; leap seconds in UTC and building a consensus for a continuous timescale; promoting the mutual benefit of UTC and GNSS; and sharing resources to improve international timekeeping.

The CCTF-WGSP has established dedicated Task Groups and Task Forces to define and organize its work. The Task Force on the roadmap for the redefinition of the second has 40 members from all RMOs, including members from the CCTF and CCTF WGs, and also external experts. The Task Force has defined a series of criteria and conditions for the redefinition of the second. These include mandatory criteria to be achieved before changing the definition of the second and conditions corresponding to essential work that will continue to be in progress when the definition is changed. The fulfilment level of the mandatory criteria will be reviewed annually. Three options for the timescale for the redefinition of the second were presented based on a redefinition being proposed at the meetings of the CGPM to be held in either 2026, 2030 or 2034. Each option includes various criteria, a timeline, and scenarios for the likelihood that these will or will not be achieved. The CCTF's preferred option is for a redefinition of the second at the 29th meeting of the CGPM (2030). For full details see document [CIPM/2021-06.01](#).

Dr Dimarcq presented *Draft Resolution E - On the roadmap towards the redefinition of the SI second* and *Draft*

*Resolution D - On the use and future development of UTC.* He concluded by commenting that the CIPM Task Group on Continuous UTC will become active in the third quarter of 2021. It is hoped that the Task Group will work towards gaining acceptance of Draft Resolution D at the CGPM by providing a forum for communication and education with Member States and other communities regarding the benefits of continuous UTC.

## CCT

Dr Duan presented the activities of the CCT as detailed in report [CIPM/2021-06.02](#). He commented that a new key comparison for body temperature measurements is planned and that a Task Group for body temperature measurement will be set up within the CCT Working Group for Contact Thermometry (CCT-WG-CTh). In addition, a CCT Task Group for Air Temperature (CCT-TG-Env-AirT) has been established within the CCT Working Group for Environment (CCT-WG-Env).

The CCT has proposed a Recommendation to the CIPM on “Requirement for new determinations of thermodynamic temperature above 400 K”. The recommendation is as follows: “*that Member State NMIs improve their capabilities in primary thermometry, by various means, above 400 K to improve determination of  $T-T_{90}$ , accompanied by appropriate research to ensure that International Temperature Scale realization remains fit for purpose, allowing access to lower uncertainty thermodynamic temperature values over a wide range for a broader community.*”

Dr Duan said that three requests for membership and observership of the CCT had been received:

- NSC IM (Ukraine) as a member. This was not fully supported by the CCT, which recommends that NSC IM becomes an official observer while gaining research experience.
- SCL (Hong Kong, China) as an official observer.
- Justervesenet (Norway) as a member.

Dr Duan completed his presentation by recalling that Dr del Campo Maldonado had become the BIPM representative at the GCOS Surface Network (GSRN) Task Team – WMO in January 2021.

**Decision CIPM/110-11** The CIPM accepted the proposal that NSC IM (Ukraine – Member State) and SCL (Hong Kong, China – Associate Economy) should become observers at the CCT.

The CIPM accepted the proposal that Justervesenet (Norway – Member state) should become a member of the CCT.

## CCEM

Prof. Rietveld referred to report [CIPM/2021-06.03](#). He recalled that there had been no reports of any issues related to the step change in electricity and magnetism ‘core’ quantities following the implementation of the revised SI on 20 May 2019.

The 32nd CCEM meeting, held online on 14-15 April 2021, had received an update on the BIPM work programme and it had been widely acknowledged by the Committee that the work of the BIPM Physical Metrology Department makes essential contributions to the comparability of measurements and to advances in electricity and magnetism.

The CCEM has revised its strategy document with input from the President, the Executive Secretary and the Working Group Chairs. This complete revision of the 2024-2027 strategy was reviewed and discussed by the CCEM members at the 32nd CCEM meeting (2021) and will be approved by correspondence in mid-2021. The

review included a discussion on the vision and mission of the CCEM.

The revised CCEM strategy includes greater focus on its impact and its links with stakeholders. In addition, the strategy describes the formation of a Task Team to organize CCEM webinars, following the example of webinars organized by the CCQM and CCRI.

Prof. Rietveld informed the CIPM about a discussion point that had arisen from the revision process; “how will we as the CCEM be involved in any decisions about the ‘digitalization’ of electrical units?”. He noted that this is a relevant question for all CCs and an issue for consideration by the CIPM Working Group on Data (CIPM-WG-DATA).

## **CCQM**

Dr Park said that the focus of the Committee’s recent activities has been the development of the CCQM Strategy Document 2021-2030. A draft has been published and the deadline for publication of the final strategy document is 30 June 2021. A table highlighting the strategic plans for each CCQM Working Group and a list of the seven strategic aims identified by the CCQM for 2021-2030 was presented. Activities in the BIPM Chemistry Department in support of the CCQM 2021-2030 Strategy have been included in an Annex to the strategy document.

Three CCQM Task Groups have been set up:

- CCQM Task Group on Stakeholder Engagement. To develop a strategy document describing strategic and operational aspects for external stakeholder engagement for the CCQM.
- CCQM Task Group on Guidance for KCRV Calculation. To update the CCQM guidance document including worked examples.
- CCQM SPWG Task Group on Comparisons. To harmonize working practices on comparison organization across WGs including pilot studies.

Dr Park recalled that the Covid-19 pandemic has been an important topic for the CCQM. A series of webinars on the subject had been organized, including the latest on 25 March 2021 on “Ensuring the reliability of measurements in response to the Covid-19 pandemic”. Two comparison studies had been organized concerning the major diagnostic methods for SARS-CoV-2 quantification. The CCQM Working Group on Nucleic Acid Analysis (CCQM-NAWG) organized the CCQM P199b: SARS-CoV-2 RNA copy number quantification study and the CCQM Working Group on Protein Analysis (CCQM-PAWG) ran the CCQM-P216: SARS-CoV-2 monoclonal antibody quantification study.

The CCQM has two workshops planned: the CCQM Workshop on Metrology for Infectious Diseases and Pandemic Preparedness on 5-7 October 2021 and the CCQM Workshop on Metrology for Microplastics on 4-8 April 2022.

The President thanked Dr Park and invited comments. Dr Wielgosz recalled that the CCQM P199b: SARS-CoV-2 RNA copy number quantification study had been organized within six months and the World Health Organization (WHO) and Standardisation of Genomic Amplification Techniques (SoGAT) communities have expressed their appreciation, as the study provided a standard solution before any reference materials were available.

Dr Liew gave a brief update on the Joint Committee for Traceability in Laboratory Medicine (JCTLM), details of which are in document [CIPM/2021-06.08](#). Two points highlighted were that:

- Prof. Greg Miller, nominated by the International Federation of Clinical Chemistry and Laboratory

Medicine (IFCC), was appointed Chair of the JCTLM in March 2021. Prof. Miller is a Professor in the Pathology Department at Virginia Commonwealth University, USA.

- The IFCC has requested a separate agreement, as described in the recent MoU, to be drafted to cover any future financial support for the JCTLM Secretariat, which is currently maintained at the BIPM. An agreement is being drafted, which will be circulated to the CIPM. The IFCC has provided an annual donation of 50 000 € for the JCTLM Secretariat's work at the BIPM for the last 14 years. The IFCC Executive board have recently reviewed all budget line items and are, in general, requesting additional documentation for collaborations that they fund of which the JCTLM is one example.

## CCM

Dr Richard referred to report [CIPM/2021-06.05](#) and gave a summary of recent information related to the redefinition of the kilogram. The final report of the CCM.M-K8.2019 key comparison of kilogram realizations has been published and the first Consensus Value for the dissemination of the kilogram was calculated by the CCM Task Group on the Phases for the Dissemination of the kilogram following redefinition (CCM-TGPFd-kg) in December 2020. The dissemination of the kilogram entered Phase 2 on 1 February 2021 and the update of CMCs for 31 NMIs, to account for the increased uncertainty in the Consensus Value, was completed on 2 June 2021.

The timetable for the next key comparison of kilogram realizations was presented. The measurement of travelling standards at NMIs will take place during September to December 2021. Comparison measurement at the BIPM is scheduled for January to March 2022. The Draft A report will be produced in June 2022, followed by the Final Report in September 2022. The second consensus value will then be calculated.

Dr Richard said that two applications for observership of the CCM have been received: CMS/ITRI (Chinese Taipei) and NSC-IM (Ukraine). Both applications are currently at the consultation stage with the CCM WG Chairs and a proposal for a decision will be made to the CIPM in October 2021.

He concluded by saying that the CCM strategy is being reviewed by a dedicated Working Group, which will hold its next meeting in July 2021. The final version of the strategy is expected to be completed in late 2021 for approval by the CCM in early 2022.

## CCRI

Dr Sené presented highlights of the report [CIPM/2021-06.06](#). He noted that the 28th meeting of the CCRI, held online in June 2021, included five new members (BEV, CMI, METAS, NMISA and NRC). Discussions at the CCRI meeting indicated that although the Covid-19 pandemic had slowed down research and some collaboration, the importance of IR metrology services was recognized widely. In addition, BIPM activities and services were highly valued by the IR community.

Dr Sené said that the CCRI had requested advice from the CIPM on whether it is possible to get a clear picture of the relevant ISO standards pipeline in order to understand where there might be a need for input from the metrology community and to prioritize effort. He asked if this is an issue for other CCs.

The CCRI strategy 2018-2028, adopted in 2019, is being reviewed and updated. A questionnaire was circulated to members, observers and liaison organizations as well as CCRI Section and Working Group members in June/July 2020. The questionnaire identified more than 50 specific items to be addressed. This input has been integrated into the second draft edition of the strategy, which was circulated for comments in March-April 2021. The final edition of the CCRI strategy will be published in mid-2021. The final edition includes a significant additional aim: *To coordinate the introduction of the SI Digital Framework in ionizing radiation metrology, including moving to digitalization of services (such as digital calibration certificates), making data from*

*comparison exercises machine-readable and machine actionable, and providing support for NMIs/DIs.*

Development of the CCRI strategy has identified the potential need for a joint CCRI/CCQM Task Group on Mass Spectrometry for Radionuclide Metrology. This is being discussed by CCRI Section II: Measurement of radionuclides (CCRI(II)), the CCQM Working Group on Isotope Ratios (CCQM-IRWG) and the CCQM Working Group on Inorganic Analysis (CCQM-IAWG). The Task Group will identify key measurement challenges for use of mass spectrometry in ionizing radiation and agree the best way to utilize combined CCRI/CCQM expertise to address these challenges.

Dr Sené said that the CCRI is investigating how to use existing and new communication tools to further its mission. The CCRI has organized a series of webinars, which started in October 2020, and have been very successful. The CCRI is creating a small advisory group working with the CCRI Executive Secretary to steer these communications activities.

A request for Observership has been received from NSC-IM (Ukraine). This application will be considered in the CCRI before being submitted to the CIPM for approval.

Dr Sené expressed his thanks, as well as that of the CCRI community, to Dr Judge on the occasion of his retirement. He welcomed Dr Gressier, the new Director of the Ionizing Radiation Department. The President added his thanks to Dr Judge. Dr Judge said that it had been a pleasure to work with Dr Sené and Dr Louw as the current and past Presidents of the CCRI. He thanked Prof. Rietveld and Dr Stock for their support in the creation of the joint CCEM-CCRI Task Group - Low Current Measurement (CCEM-CCRI-TG-LCM). This Task Group will be useful in reducing the dependence of the ionizing radiation community on sealed radioactive sources, which will help to improve safety.

## **CCU**

Prof. Ullrich said that the CCU had not met since the last meeting of the CIPM, however three documents had been made available on the CIPM members' working area of the BIPM website (see the zipped file [CIPM/2021-06.07](#)) for comment: *Draft Agenda for the 25th meeting of the CCU (21-23 September 2021)*; *Draft Resolution C of the 27th CGPM (2022) – extension of the range of SI prefixes*; and *Report of the meeting of the CCU Working Group on Strategy (CCU WG-S) held on 26-27 January 2021*.

Prof. Ullrich commented that the results of the questionnaire for CCU members and stakeholders on the implementation of the new definitions of the SI will be discussed at the CCU meeting in September 2021. He noted that *Draft Resolution C of the 27th CGPM (2022) – extension of the range of SI prefixes* had been circulated among the CCU members, where it received positive comments. It is now being made available to the CIPM for comment ready for discussion at Session II of the 110th meeting in October 2021.

NSC IM (Ukraine) has applied to become a member of the CCU. This request will be discussed at the meeting in September 2021.

Prof. Ullrich concluded by commenting on a non-CCU issue. He said that the CIPM Task Group on the Digital SI (CIPM-TG-DSI) has asked the CIPM to consider how the CIPM-TG-DSI can best liaise with all the Consultative Committees.

## 7. FINANCE

### Report from the CIPM Sub-Committee on Finance

Dr Richard said that the Sub-Committee had held its last meeting on 15 June 2021. He congratulated the Director and the team at the BIPM for the good financial performance in 2020 and for the efficient preparation and completion of the financial statements. The preparation of the audit for both the BIPM and the Pension and Provident fund was singled out for praise. Dr Richard recalled that he had established a quarterly update with the Director and the Head of the BIPM Finance Office. Two such meetings had been held so far in 2021, including one with the auditor. The auditor, Mr Griton from KPMG, had been very impressed that the BIPM had managed to maintain its business during 2020, despite the Covid-19 pandemic; there had been no impact on the financial situation or the audit. Dr Richard recalled that the auditor had commented that the Covid-19 pandemic had further confirmed the decision taken several years ago to externalize the preparation of the financial report to the accounting company, In Extenso. The collaboration between the BIPM, In Extenso and KPMG works very efficiently.

Possible future changes to the IPSAS standard had also been discussed with the auditor.

Dr Richard said that he had received the first draft of the French version of the Financial Statements 2020 at the end of April 2021. The French and English versions of the draft financial statements had been distributed to the members of the Sub-Committee on Finance and the CIPM for comment on 17 May 2021. Dr Richard recalled that the Director had given an overview of the Financial Statements 2020 to the June meeting of the Sub-Committee on Finance. One of the key points from the overview and the discussions at the meeting was that all Member States will be clear to participate in the 27th meeting of the CGPM (2022).

The Sub-Committee on Finance had noted that an unqualified report had been received from the auditor (see document [CIPM/2021-07.02](#) “Financial Report 2020”). Following receipt of the audit report and the subsequent discussions, the members of the CIPM Sub-Committee on Finance had agreed unanimously that the 2020 audited Financial Statements BIPM and of the BIPM Pension and Provident Fund should be recommended to the CIPM for approval and that the BIPM Director should be granted quietus for the 2020 exercise.

The President thanked Dr Richard and asked the CIPM for approval of the Financial Statements and to grant the BIPM Director quietus for the 2020 exercise. There were no comments and approval and quietus were granted unanimously.

**Decision CIPM/110-12** The CIPM confirmed its approval of the audited financial statements of the BIPM and of the BIPM Pension and Provident Fund which were reviewed by the CIPM Sub-Committee on Finance in June 2021. The CIPM granted the BIPM Director quietus for the 2020 exercise.

Dr Richard informed the CIPM that the auditor, Mr Griton from KPMG, is scheduled for re-election for the three-year period 2021-2023. A presentation on his suitability was given and it was noted that CIPM Sub-Committee on Finance recommends the re-election of Mr Griton for the review of the BIPM accounts for 2021-2023. The CIPM agreed with this proposal.

The President referred to the documents in the zipped file [CIPM/2021-07.01](#) “*Audit of the accumulated arrears of a defaulting Member State or excluded Member State and advances made by other Member States*”, which had been available on the CIPM members’ working area of the BIPM website for noting.

### Update on payments received and spend to date

The Director said that the contributions and subscriptions received as of 21 June 2021 totalled 8 900 400 €



which is very similar to the amounts received at the same time over the last four years. The impact of the ongoing Covid-19 pandemic on expenditure against budget in 2021 is similar to the situation in 2020, except for the cost of meetings.

A series of additional financial control measures have been implemented. These include the introduction of an electronic payslip system for all staff and pensioners, an ongoing project to encourage all suppliers to send invoices electronically, and regular updates to all staff on cyber financial fraud.

## 8. REPORT FROM THE BIPM ON PROGRESS WITH THE 2020-2023 WORK PROGRAMME

Document [CIPM/2021-08.01](#) “*Annual Review: Supplement - Activities of the BIPM Departments (1 January 2020 - 31 December 2020)*” was available on the CIPM members’ working area of the BIPM website for noting.

## 9. STRATEGY FOR THE BIPM AND TIMETABLE FOR THE PREPARATION OF THE WORK PROGRAMME (2024-2027)

The President referred to the documents in the zipped file [CIPM/2021-09.01](#) “*Strategic Plan (2022) for the BIPM, version 2 (2021-05-17) and Comments*”, which had been available on the CIPM members’ working area of the BIPM website in advance of the meeting. He said that comments had already been received and asked if there were any other ‘high-level’ remarks. He added that the commenting process can continue for a few weeks after the meeting. It was suggested that the Strategic Plan requires a contextual explanation as the current document begins with high-level statements and then goes straight into low-level detail including actions, which is unusual for a strategy document. The contextual explanation could include the Vision, Mission and Objectives that were approved by the 26th meeting of the CGPM (2018). The Director replied that this will be addressed in the next version, which will be discussed with the President and Secretary of the CIPM.

Mr Henson thanked the CIPM for the comments that had been received on the Strategic Plan (2022) for the BIPM so far and encouraged them to submit any additional comments as soon as possible so that the document can be made available for consultation.

## 10. PLANS FOR THE 27TH MEETING OF THE CGPM

The Director said that the dates for the 27th meeting of the CGPM would be in the week 14-18 November 2022 and that the Palais des Congrès de Versailles is available to host the meeting following a major refurbishment. The booking requires confirmation before the end of June 2021. He noted that the venue is suitable for more than 300 attendees, even if social distancing is required. After considering several venues the BIPM recommends it as the preferred option. The venue offers flexibility if a hybrid meeting is necessary, following the installation of new IT facilities. A hybrid meeting platform has been identified and online voting platforms are being studied. The Director commented that at present, there is too much uncertainty to predict whether the conference will be held as a physical meeting, a hybrid meeting or fully online.

The Director confirmed that Prof. Patrick Flandrin, the President of the *Académie des Sciences* 2021-2022, has agreed to act as the President of the 27th meeting of the CGPM. The draft programme for the 27th meeting will be presented to the CIPM at its meeting in October 2021. The Director added that a number of draft resolutions are under discussion and encouraged the CIPM to refer to each resolution using the letters that have been

assigned to them to avoid confusion.

The Director invited questions and comments. It was asked if there is any financial risk associated with booking the venue in advance and the situation if the conference venue is cancelled due to Covid-19. It was confirmed that the contract with the venue includes a clause that cancellation due to Covid-19 will result in no financial loss. The President said that following confirmation that cancellation due to Covid-19 will not incur any financial penalties, the CIPM could give its agreement to book the Palais des Congrès de Versailles for 14-18 November 2022.

The President asked if there are any existing rules relating to holding the General Conference as a hybrid meeting. The Director said that although there are no established guidelines within the BIPM for holding hybrid meetings, many other organizations, for example the OIML, are holding their plenary meetings online despite not having specific regulations. The deadline for deciding whether to hold the General Conference as a hybrid meeting was discussed. It was agreed that this should be readdressed at the October 2021 session of the CIPM meeting. Currently there are too many uncertainties regarding the future direction of the Covid-19 pandemic, however it is likely that a certain level of remote participation in the General Conference will be required.

It was suggested that because the decision on the format of the meeting is very important, criteria should be developed to allow the decision to be made. The President suggested that the criteria could be discussed at the October meeting and a final decision on the format of the General Conference could be delayed until March 2022 at the latest.

## 11. UPDATE FROM THE JCRB

### JCRB Recommendation 43/1 on the status of GULFMET as an RMO

Dr Olthoff recalled that the Joint Committee of the Regional Metrology Organizations and the BIPM (JCRB) had met online on 15-17 March 2021. One of the main points at the meeting had been discussions on the acceptance of GULFMET as an RMO. He reported that the JCRB had agreed Recommendation JCRB/43-1 (2021) *“The JCRB agrees that GULFMET fulfils all requirements described in CIPM MRA-P-12 Appendix B, section B1, and recommends the CIPM to admit GULFMET as a full member of the JCRB, with a voice and the right to vote.”* Dr Olthoff said that he fully supported the recommendation of the JCRB and added that GULFMET actively participates in the JCRB meetings. This view was echoed by the President, who asked for any comments. Prof. Rietveld said that GULFMET is an active participant in CCEM meetings and he fully supported the proposal.

The President asked the CIPM if they agreed that GULFMET should become a full RMO. There was unanimous support and the following decision was adopted.

**Decision CIPM/110-13** Following JCRB Recommendation JCRB/43-1 (2021), the CIPM decided to admit the regional metrology organization Gulf Association for Metrology (GULFMET) as a full member of the JCRB, with a voice and the right to vote.

## 12. UPDATE FROM THE CIPM PRESIDENT ON THE WORK OF THE AD HOC WORKING GROUP OF MEMBER STATE REPRESENTATIVES

The President referred to the three documents in the zipped file [CIPM/2021-12.01](#) *“Update from the CIPM*

*President on the work of the ad hoc Working Group of Member State Representatives*". The three documents are "*Legal opinion on the legal principles concerning the competence of the organs of the International Bureau of Weights and Measures to enter into legal agreements dated 19 May 2021*", "*Email from the President of the CIPM (Input requested by the State Representative Working Group) dated 2 June 2021*", and "*Member State Working Group letter dated 21 May 2021*." He said that the *ad hoc* Working Group of Member State Representatives had met several times. Most recently the Chairs had written a letter, dated 21 May 2021 (see above), which included the intended content of their draft resolution as an annex. This letter requested the CIPM to provide its considered views by the end of August 2021 on six issues:

- to clarify, in light of the proposed suggestions, how to refer to Associate States
- the organization of the budget process
- the role of RMO and NMIs in the governance of the organization
- the prerogatives to enter into agreements on behalf of the organization
- the preparation of the CGPM
- consultation with members.

Any feedback submitted by the CIPM will be discussed by the *ad hoc* Working Group at its next meeting.

The President invited comments on the six issues and suggested that due to the limited time available, an informal meeting should be held online to allow members to comment. Dr Steele said that sharing the CIPM perspective with the *ad hoc* Working Group of Member State Representatives is important. He added that some of the questions from the Working Group may simply require information or clarification from the CIPM. For example, some clarification that the RMOs are already engaged in the governance of the CIPM MRA and the JCRB. There has also been a recent deepening of this engagement through the regular meetings of the RMO Presidents. Dr Steele said that such information should be fed back to the *ad hoc* Working Group to enlighten participants that there are mechanisms already in place that address some of the issues raised. In such cases, it may be a question of improving the way in which the operation of the existing mechanisms is communicated to the Member State representatives. He cautioned that the issue raised on the organization of the budget process may be linked to the question of consultation. The CIPM interpretation may be that the process is very formal, considers the Work Programme and is carried out in consultation with the CIPM Sub-Committee on Finance. However, some Member State representatives may have concerns about how the budget process is related to the dotation process and the vote at the General Conference. Dr Steele said that there is a lack of clarity over this process among the Member State representatives. He suggested that the CIPM emphasize the areas of the budget process that are clearly defined and those areas that can be addressed by the modernization process. Dr Park suggested that a discussion is needed with the Member States on how support can be provided to CIPM members, considering that, once elected, they are not representatives of any Government, State, institute, or metrology institute and do not represent them in their capacity as CIPM members.

The President said that the prerogatives to enter into agreements on behalf of the organization had been discussed at the Working Group. Consequently, the President and Director had commissioned the document "*Legal opinion on the legal principles concerning the competence of the organs of the International Bureau of Weights and Measures to enter into legal agreements dated 19 May 2021*". He added that due to the time limit, rather than discussing the details in the meeting, members can continue to send comments after the meeting. All the comments received from the CIPM on the six issues raised by the *ad hoc* Working Group of Member State Representatives will be brought together in a document for discussion at an online meeting to be scheduled during July or August 2021. The BIPM meetings office was asked to assist with organizing the meeting.

### 13. OTHER BUSINESS

#### Update from the CIPM Task Group on the “Digital-SI” Framework

The presentation of report [CIPM/2021-13.01](#) “CIPM Task Group on the Digital SI” was delayed.

#### Update on liaison with the OIML

Dr Richard recalled that the Joint Task Group between the BIPM and the OIML was set up as outlined in Decision CIPM/109-15 (2020). The Task Group met in December 2020, March 2021 and June 2021, where it discussed joint representation for liaison activities, joint initiatives, promotion of metrology, and promotion of digital transformation. The next meeting is planned for September 2021. The Task Group is considering a joint event to celebrate the 150th anniversary of the signing of the Metre Convention and the 70th anniversary of the OIML in 2025. An MoU to define the aspirations of the BIPM and the OIML collaborative activities may be considered in the future and sharing of resources is also kept under review.

#### CIPM Rules of Procedure

The President referred to document [CIPM/2021-13.02](#) “CIPM Rules of Procedure”, which was available on the CIPM members’ working area of the BIPM website for noting (See §3, Decision CIPM/110-08).

#### Report to the CIPM on activities of interest (JCGM, JCGM-WG2, CCU-WG-CMT)

The President recalled that report [CIPM/2021-13.03](#) “*Report to the CIPM on activities of interest (JCGM, JCGM-WG2, CCU-WG-CMT)*” was available for noting in the CIPM members’ working area of the BIPM website. Prof. Neyezhnikov added that the CCU Working Group on Core Metrological Terms (CCU-WG-CMT) will hold its next meeting on 25 June 2021.

#### Participation in the Global Climate Observing System (GCOS), Surface Reference Network Task Team (GSRN-TT)

Dr del Campo Maldonado said that the report [CIPM/2021-13.04](#) “*Report: Participation on the Global Climate Observing System (GCOS), Surface Reference Network Task Team (GSRN-TT)*” was available for information in the CIPM members’ working area of the BIPM website. It was agreed that Dr del Campo Maldonado will continue as the CIPM representative to the GSRN-TT.

#### Virtual department visits

Virtual visits were organized to the Chemistry, International Liaison and Communication, Ionizing Radiation, Physical Metrology and Time Departments on Tuesday 22 June. The visits were scheduled to last 90 minutes and the CIPM divided into five groups of three or four members to take part in them. Feedback on the visits was given on Wednesday 23 June. The feedback given by the CIPM members was positive.

### 14. DATES AND FORMAT FOR THE CIPM MEETINGS IN 2021 AND 2022

#### Meeting format in October 2021

The President proposed that Session II of the 110th meeting of the CIPM in October 2021 be held online. This proposal was made due to the ongoing uncertainty surrounding the coronavirus pandemic. The CIPM members discussed the proposal, noting that although face-to-face meetings are preferred, there are many uncertainties

concerning travel restrictions and the health situation in individual countries. Dr Olthoff and Dr Castelazo commented that everything possible should be done to have a face-to-face meeting considering the timelines for the preparations for the 27th meeting of the CGPM (2022). It was agreed that the President will discuss the situation with the CIPM Secretary and the BIPM Director and a cut-off date will be set for deciding on whether to hold a physical meeting at the BIPM in October 2021. The President expressed his hope that should this not be possible, a physical meeting of the CIPM will be possible in March 2022 and asked all CIPM members to block out week 12 of 2022 in their diaries.

### **Plans by APMP for the NMI Directors' meeting**

Dr Usuda presented document [CIPM/2021-14.01](#) "*Report on the preparation of the NMI Directors meeting in 2021*". He said that the NMI Directors meeting, scheduled for 21-22 October 2021, is being prepared by three young metrologists from APMP: Dr PARK Yon-Kyu (KRIS), Dr YANG Ping (NIM) and Dr AKOSHIMA Megumi (NMIJ), with Dr Usuda acting as a mentor. Preparatory meetings have been held to discuss agenda items, the timeline for the meeting, and survey information. The format of the meeting (online or physical) is to be decided and a range of topics for the meeting are under discussion, including Covid-19, digital SI, and implementation of the new definition of the SI. Dr Usuda commented that advice is needed from the CIPM on the format of the meeting and other topics for inclusion, such as the CIPM strategy and the CGPM draft resolutions related to the strategy. The CIPM agreed that both topics can be included on the agenda for the NMI Directors meeting if there is sufficient time. The CIPM recommended to hold the meeting online, considering the uncertainty of the pandemic situation in October 2021 and difficulties in hosting it safely at the BIPM (for example maintaining social distancing). Dr Usuda commented that APMP would also prefer to hold the meeting online.

It was asked if the proposed meeting is only for NMI Directors. The President said that the agenda for the NMI Directors meeting should indicate that State Representatives will be able to participate in the meeting; it is not exclusively for NMI Directors.

The President thanked Dr Usuda and closed the meeting.