

**International Committee
for Weights and Measures**

Proceedings of Session I

of the 108th meeting

(20-21 March 2019)

Executive Summary

Session I of the 108th meeting of the CIPM (20-21 March 2019)

CIPM bureau

The new members of the CIPM bureau were elected by secret ballot as follows: Dr Louw (President), Dr Usuda (Secretary), Dr Olthoff (Vice-President) and Prof. Ullrich (Vice-President).

Appointment and re-appointment of CC Presidents

The Presidents of the ten Consultative Committees were appointed, or re-appointed, for four-year terms.

CIPM Sub Committees and *ad hoc* Working Groups

CIPM members were appointed to serve on the CIPM Sub Committees and *ad hoc* Working Groups.

Dr Steele was appointed as Chair of the PFAB and Dr Usuda was appointed as Chair of the CIPM *ad hoc* Working Group on Conditions of Employment.

CIPM Task Group to propose ToR for a Working Group of Member State representatives

A CIPM Task Group was established to propose terms of reference for a Working Group of Member State representatives. This was in response to discussions held before the adoption of Resolution 3 “On the objectives of the BIPM” at the 26th meeting of the CGPM,

CIPM Task Group on “unit”

Establishment of the CIPM Task Group on “unit” was confirmed. The Chair will propose terms of reference to the next meeting of the CIPM.

CIPM *ad hoc* Working Group on the Reproducibility of Research Data and Related Topics

Dr Liew was charged with drafting terms of reference for the CIPM *ad hoc* Working Group on the Reproducibility of Research Data.

Joint ILAC - CIPM Communication

Revisions to the *Joint ILAC - CIPM Communication* were approved.

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

As of 20 March 2019

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.

K. Iizuka, Japan.

R. Kaarls, the Netherlands.

J. Skákala, Slovakia.

Agenda

1. Opening of the session, quorum and approval of the agenda
2. Confirmation of the minutes of the 107th meeting and list of decisions
3. Report on the work of the CIPM bureau by the CIPM Secretary
4. Update on the activities of the BIPM by the Director
5. Review by the retiring President of achievements of the CIPM
6. Introduction of the election procedure for the CIPM bureau
7. Election of the CIPM President
8. Election of the CIPM Secretary
9. Election of the CIPM Vice-Presidents
10. Proposal received from the CIML President to form a Task Group with the OIML
11. Actions arising from Resolution 5 (On the financial arrears of Member States and the process of exclusion)
12. Reflections on the CIPM election process
13. Media report
14. Appointment of Presidents for the CCQM and the CCTF
15. Confirmation of incumbent CC Presidents
16. Reports from the CC Presidents
17. Appointment of chairs and members for the PFAB and the *ad hoc* WG on Conditions of Employment
18. Appointment of members to the CIPM Sub-Committees and *ad hoc* groups and review of Terms of Reference
19. Appointment of CIPM representatives to the JCRB, JCTLM and JCGM
20. Liaison with ILAC
21. Feedback from the laboratory visits and CBKT report
22. Preparations for the establishment of a WG of Member State representatives
23. Dates for future meetings of the CIPM
24. Other meetings and proposals for future workshops
25. Any other business

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

The International Committee for Weights and Measures (CIPM) held Session I of its 108th meeting on Wednesday 20 to Thursday 21 March 2019 in the Pavillon de Mail.

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. Neyezhmakov, J. Olthoff, S.-R. Park, M.L. Rastello, P. Richard, G. Rietveld, M. Sené, A. Steele, J. Ullrich and T. Usuda.

Apologies for absence: W.E. May.

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), F. Rojas Ceballos (Legal Adviser) and R. Sitton (Publications Officer).

The following were in attendance for parts of the meeting:

Outgoing CIPM members: L. Érard, B. Inglis, J.W. McLaren.

BIPM: A. Henson (Director of the International Liaison and Communication Department), S. Judge (Director of the Ionizing Radiation Department and Executive Secretary of the CCRI), M. Stock (Director of the Physical Metrology Department and Executive Secretary of the CCEM), 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).

Dr Inglis, outgoing President of the CIPM, opened the session. He welcomed the newly-elected members of the CIPM and said that Dr May (outgoing CIPM member and President of the CCQM) had sent his apologies and was unable to attend the meeting. With all 18 members present the quorum was satisfied according to Article 12 of the Regulations annexed to the Metre Convention.

The President asked if there were any changes or additions to the draft agenda that had been prepared by the bureau. Dr Rietveld commented that discussions on matters arising from the 26th meeting of the CGPM (§10, 11, 12, 13 and 22) should commence on 20 March to ensure there is sufficient time to exchange initial thoughts and opinions.

2. **CONFIRMATION OF THE MINUTES OF THE 107TH MEETING AND LIST OF DECISIONS**

The minutes of the 107th meeting (2018) had been approved by correspondence and were accepted as a true record.

Decision CIPM/108-01 The CIPM accepted the minutes of the 107th meeting of the CIPM as a true record.

The President read the decisions of the 107th meeting of the CIPM. All the actions had either been completed or will be dealt with later in the agenda.

The Director asked the CIPM to recall that it had made one decision by correspondence since its previous session:

Decision CIPM/108-02 The CIPM noted the decision taken by correspondence on 14 August 2018 amending regulation 8.2 of the BIPM Regulations, Rules and Instructions (RRI) to stipulate that the whole service under fixed-term appointments shall not exceed 5 years.

3. REPORT ON THE WORK OF THE CIPM BUREAU BY THE CIPM SECRETARY

Dr McLaren, Secretary of the CIPM, gave his report (see Appendix 1) on the bureau meeting held on 18 March 2019. The report also covered the Secretary's attendance at the annual Management Review meetings for the BIPM Quality Management System and the Health and Safety System, the annual BIPM/International Laboratory Accreditation Cooperation (ILAC) and BIPM/International Organization of Legal Metrology (OIML) bilateral meetings and the annual BIPM/ILAC/OIML/International Organization for Standardization (ISO) quadrilateral meeting, which were held on 18-19 March 2019.

Prof. Ullrich added that discussions within the bureau on the document ILAC P10:01/2013 "*ILAC Policy on Traceability of Measurement Results*" had been of particular significance. This is an important document for the CIPM and it is being revised in connection with the standard ISO/IEC 17025:2017 "*General requirements for the competence of testing and calibration laboratories*". He stressed that it is essential that certain aspects of the ILAC P10 document on the accreditation of NMIs are retained and suggested that a CIPM position be available. There was a brief discussion and the President noted the importance of this issue, which will be discussed further by the bureau. The CIPM discussed issues arising from the bilateral meeting with ILAC relating to the *Joint statement by the CIPM and ILAC* under §20.

Mr Henson said that the partners in the quadrilateral meeting, BIPM, ILAC, OIML and ISO, which are also parties to the International Network of Quality Infrastructure (INetQI) initiative, have agreed to work together to produce joint materials that can be used at presentations given to other organizations.

4. UPDATE ON THE ACTIVITIES OF THE BIPM BY THE DIRECTOR

Dr Milton reported on activities since the last meeting of the CIPM in June 2018.

He said that four months had passed since the 26th meeting of the CGPM (2018) and therefore four months had passed since the election of the new members of the CIPM. He expressed his thanks to Fiona Auty (NPL) and her team of PR experts from the NMIs who had contributed towards making the General Conference a successful global event. In relation to this, a media report has been prepared and will be presented in §13. The Director commented that the first draft of the report of the 26th meeting of the CGPM is already available and has been provided to the outgoing President and Secretary for comment. The rapid drafting of the report was aided by access to a transcript of the full meeting, which was prepared by a specialist external company.

In terms of staff issues, the BIPM Secretariat has been renamed the "Executive and Meetings Office" and a new designation of "Head of Service" has been introduced for the heads of the Executive and Meetings Office, Finance and Human Resources. Planning has started for two actions that will require the oversight of the CIPM in 2019 through the Pension Fund Advisory Board (PFAB) and the CIPM *ad hoc* Working Group on Conditions of Employment. The first is a salary survey, which is in the process of being commissioned and will be carried forward in association with the new chair of the *ad hoc* Working Group on Conditions of Employment. The second is an actuarial study, which was started with the assistance of the outgoing chair of the PFAB. The Director commented that he is looking forward to continuing with these actions with the new chairs, following their election.

The Director reported that he is continuing to defend the decisions and the decision making processes of the CIPM in the face of legal challenges at the Administrative Tribunal of the International Labour Organization (ILOAT) that were mounted by retired staff. These legal challenges are complex and time-consuming to

address.

The report of spending against budget for 2018 has been completed and submitted to both the chair of the CIPM Sub-Committee on Finance and the CIPM bureau. The draft results for 2018 in full financial format are expected on 22 March 2019. The BIPM position with regard to income is the best it has ever been; there are no Member States that are more than one year in arrears with their contributions. The practical benefit of this is that the preparation of the annual notification is much easier and it will be completed and sent to Member States earlier than has been possible in previous years.

The Director reported that in terms of site and laboratory issues, the BIPM had been inspected by two officials from the *Autorité de sûreté nucléaire (ASN)* in February 2019. For many years, the BIPM's licence to hold, import and export radioactive materials had been managed by the local Prefect's office. This responsibility has been transferred by the French authorities to be under the supervision of the ASN. Although the BIPM is officially exempt from jurisdiction of the French national authorities, the Director welcomed the opportunity to demonstrate that the BIPM's standards fully meet what is expected in France. He wrote to the ASN to say that the BIPM welcomed the inspection and review although it is not subject to its jurisdiction. The provisional feedback from the visit of the inspectors is that they will recommend an extension of the BIPM's licence.

The Director said that for World Metrology Day 2019 a joint message with the BIPM Director has been published, giving one unified message for metrology. The proposals made by the CIPM President at the 26th meeting of the CGPM, regarding closer cooperation between the BIPM and the OIML, will be addressed later in the agenda.

Among the visits to the BIPM, the Director highlighted two in particular. The BIPM hosted a visit from M. Jacques Maire, *député LREM de la 8ème circonscription des Hauts-de-Seine* on 2 July 2018 and on 7 March 2019 the BIPM Chemistry Department hosted a visit from the Nobel Prize winner, and President of the Royal Society, Dr Venkatraman Ramakrishnan.

The Director said that during the four months since the General Conference he has worked closely with the outgoing CIPM President to ensure that everything that can be addressed within his term of office has been addressed. There are however some issues remaining that will be addressed after the election of the next President. The Director said that he looks forward to working with the new President.

5. REVIEW BY THE RETIRING PRESIDENT OF ACHIEVEMENTS OF THE CIPM

Dr Inglis, the outgoing President of the CIPM expressed his thanks to the outgoing CIPM for their efforts over the last four years. He identified some highlights in the work of the CIPM since its election in November 2014. It has:

- Implemented all recommendations from the “Review on the Role, Mission, Objectives, long-term Financial Stability, Strategic Direction and Governance of the BIPM”, reported at the 25th meeting of the CGPM (2014). A clear mission and objectives for the organization have now been ratified by the CGPM.
- Established or renewed CIPM Sub-Committees to address specific issues and to take full advantage of and to benefit from the expertise within the CIPM membership.
- Developed common objectives and strategic plans for all Consultative Committees (CCs); broadened participation in CCs by introducing a right for the NMIs from all Member States to attend as

observers.

- Established annual joint CC Presidents’ meetings to address multi-disciplinary challenges and improve inter-CC communications.
- Instituted annual meetings between the CIPM bureau and the Chairs of the Regional Metrology Organization (RMO).
- Coordinated and led a review of the CIPM MRA in accordance with Resolution 5 of the 25th meeting of the CGPM (2014) “On the importance of the CIPM Mutual Recognition Arrangement”.
- Established the CIPM *ad hoc* Working Group on Implementing the Recommendations from the Review of the CIPM MRA to oversee the implementation of the review recommendations. All recommendations have now been addressed with the exception of KCDB 2.0, which is expected to be in place in 2019.
- Presided over a growth in membership, with five new Member States having acceded and six new Associates having joined.
- Introduced reduced subscriptions for Associate States with developing economies as a first step towards broadening involvement in the work of the BIPM.
- Established the Pension Fund Advisory Board (PFAB) with staff and pensioner representation.
- Implemented a new pension plan to address long-term sustainability issues. New contribution and benefits schedules were implemented from 1 January 2017.
- Established the CBKT Programme, which is supported by grant funding from NMIs and, following the 26th meeting of the CGPM, from a part of the dotation from 2020 onwards.
- Implemented excellent financial management with the assistance of the Director, the BIPM Finance Office and the CIPM Sub-Committee on Finance.
- Achieved the redefinition of SI base Units after more than 20 years of collaboration between the NMIs and facilitated through the CCs.

Dr Inglis added that the 26th meeting of the CGPM had been outstanding and in his opinion, possibly the best ever. He expressed special thanks to the Director and his staff for having organized such a successful General Conference. He concluded by thanking the outgoing members of the CIPM and the bureau for their contributions and support. He wished the incoming CIPM well for the future.

6. INTRODUCTION OF THE ELECTION PROCEDURE FOR THE CIPM BUREAU

Dr McLaren, the outgoing CIPM Secretary, outlined the procedure for the election of the bureau, details of which are available in a document on the BIPM website.¹ He commented that nine members of the CIPM had put their names forward as candidates for positions on the CIPM bureau, with some candidates applying for alternative positions in the event that they were unsuccessful in being elected to a higher position. Each candidate would be allowed five minutes to make an introductory statement in support of their application. The

¹ “Guidelines for election of the CIPM bureau” <https://www.bipm.org/utis/en/pdf/CIPM-election-bureau.pdf>

order in which the statements were made was determined by drawing of lots. Each candidate had previously supplied written statements, which had been made available to the CIPM. In instances where a candidate was unsuccessful in being elected to a particular position and subsequently stood for an alternative position, the introductory statement for the alternative position was limited to two minutes. All 18 members of the CIPM as well as the Director of the BIPM, as an *ex officio* member, were eligible to vote. The majority required for a candidate to be declared successful was ten votes.

In response to a question, Dr McLaren confirmed that candidates would have the opportunity to withdraw from the election process at any stage. It was suggested that each candidate should state the amount of time they have available to fulfil the obligations of the role they have applied for.

Dr McLaren was assisted in the election process by Ms Fellag Ariouet and Mr Rojas Ceballos.

7. ELECTION OF THE CIPM PRESIDENT

The four candidates for the position of CIPM President gave their introductory statements. Following a secret ballot, which consisted of three rounds of voting, Dr Louw was elected as the CIPM President.

Dr Louw thanked the CIPM for their confidence and he offered his commiserations to the other candidates. He took over the chairmanship of the meeting from Dr Inglis.

Decision CIPM/108-03 The CIPM elected Dr W. Louw as President of the CIPM by secret ballot.

8. ELECTION OF THE CIPM SECRETARY

The three candidates for the position of CIPM Secretary gave their introductory statements. Following a secret ballot, which consisted of two rounds of voting, Dr Usuda was elected as the CIPM Secretary.

9. ELECTION OF THE CIPM VICE-PRESIDENTS

Dr McLaren commented that there was currently no differentiation between the roles of the two Vice-Presidents. They were both members of the bureau and were expected to attend and participate in all bureau meetings. He commented that the new CIPM may wish to review this situation. The seven candidates for the two vacancies for CIPM Vice-Presidents gave their introductory statements. Following two sequential secret ballots, which consisted of several rounds of voting, Prof. Ullrich and Dr Olthoff were elected.

Decision CIPM/108-04 The CIPM elected the following by secret ballot:

- Dr T. Usuda as Secretary of the CIPM;
- Prof. J. Ullrich and Dr J. Olthoff as Vice-Presidents of the CIPM.

Dr McLaren thanked Ms Fellag Ariouet and Mr Rojas Ceballos for their assistance during the election process. Dr Louw thanked Dr McLaren for carrying out his last official duty as the outgoing Secretary and invited Dr Usuda to take the chair as CIPM Secretary. He congratulated the successful candidates and thanked the unsuccessful candidates for having taken part.

10. PROPOSAL FROM THE CIML PRESIDENT TO FORM A TASK GROUP WITH THE OIML

Dr Milton introduced a report on progress with the proposal to set up a joint task group between the BIPM and the OIML and said it was based on two sources of information. The first was the presentation made by Dr Schwartz, the CIML President, to the 26th meeting of CGPM where he had talked about his suggestion, and that of the OIML Presidential Council, to set up a joint task group to discuss closer collaboration. The second was a meeting held on 19 March 2019 between the CIPM bureau and the OIML President, the BIPM Director and a member of the OIML Presidential Council where the issue had been discussed further. Prof. Ullrich added that the meeting on 19 March had been productive and he stressed that there are many existing and evolving connections between the OIML and the BIPM at the working level. He cited the example of regular contact between the BIPM Director, Mr Henson (Director of the International Liaison and Communication Department) and Mr Donnellan, the newly appointed BIPM Director. Prof. Ullrich recalled the comments made by the CIML President at the 26th meeting of the CGPM, where he had proposed the idea of having “one metrology”, consisting of both scientific and legal metrology, and had suggested the establishment of a joint task group to investigate closer collaboration between the BIPM and OIML. However, he noted that progress with the setting up of a task group has slowed since the General Conference due to a decrease in enthusiasm from the OIML Presidential Council.

Dr Milton said that the outcomes of the meeting held on 19 March 2019 included a commitment for the BIPM and OIML to continue to work together in practical ways such as sharing best practice in IT, allowing the OIML to use meeting rooms at the BIPM when they are available and the BIPM gaining access to the OIML’s practices and experience in e-learning platforms. The joint World Metrology Day initiative was also discussed, particularly how the BIPM and OIML can work together to increase its impact, along with the idea of jointly developing promotional slides to ensure that both organizations present a clear and coherent picture of “what metrology is” to external audiences. Linked to this was the idea of being more strategic in the way the BIPM and OIML carry out joint representations. This could include sharing of diaries and invitations.

Clarification was sought as to whether the plans for establishing a common task group were to proceed. Dr Milton replied that the OIML Presidential Council is less enthusiastic about the idea of setting up a common task group than the other parties. However, he noted that the BIPM and OIML have an existing and very good liaison at the operational level. Prof. Ullrich added that an alternative suggestion was the establishment of a joint operational task group. Dr Inglis clarified that one issue with the establishment of a common task group was defining its focus. Dr McLaren said that he had been surprised by the lack of enthusiasm for the common task group at the meeting on 19 March 2019, but added that the OIML Presidential Council will be reminded that there had been significant support for this proposal at the 26th meeting of the CGPM. Prof. Ullrich was optimistic that further progress will be made. The President summarized by saying that there was support to establish a Joint Task Group at an operational level to further improve the cooperation between the BIPM and OIML.

Following a brief discussion, Dr Liew was appointed to act as CIPM liaison to the Task Group.

Decision CIPM/108-05 The CIPM supported the establishment of a Joint Task Group at an operational level to further improve the cooperation between the BIPM and the International Organization of Legal Metrology (OIML), following the proposal made by the President of the International Committee of Legal Metrology (CIML). Dr T. Liew was appointed to act as CIPM liaison to the Task Group.

11. ACTIONS ARISING FROM RESOLUTION 5 (ON THE FINANCIAL ARREARS OF MEMBER STATES AND THE PROCESS OF EXCLUSION)

The Director recalled that Resolution 5, adopted at the 26th meeting of the CGPM, imposes several actions on the CIPM. In particular the CGPM decided that:

- the CIPM shall implement Article 6 paragraph 8 of the Annexed Regulations,
- the CIPM shall address the situation where historical practice has resulted in the accumulation of arrears.

The Director added that Article 6 paragraph 8 of the Annexed Regulations outlines the measures that will be used for exclusion and are in the Metre Convention. He said that a briefing note had been prepared with Mr Henson, that provides information to the CIPM regarding the actions needed following the adoption of Resolution 5. The suggestion was that the CIPM may wish to set up a small *ad hoc* working group to look into the technical, diplomatic and legal issues and to start making progress with the future methodology for dealing with the financial arrears of Member States and the process of exclusion, now that a mandate has been received from the General Conference. He added that substantial progress will need to have been made on this issue in time for the 27th meeting of the CGPM and suggested that the bureau may wish to discuss what mode of operation the CIPM should adopt to move forward with this issue. In response to a question, the Director clarified that the proposed *ad hoc* working group would examine policy and not financial aspects.

Dr Steele asked a question related to the second bullet point. He requested clarification as to whether the CIPM was being asked in what way it should address the historical practice or was it first being asked to decide how much accumulated arrears need to be managed. The President replied the financial information is available and that the bureau will discuss how to proceed at its meeting on 22 March 2019. The topic will then be added to the agenda of the next session of the CIPM in October 2019 for further discussion. Dr Milton added that the BIPM is approximately 98 % of the way through reviewing all of the financial aspects going back to 1982. The data, which will give a clearer picture on the situation, will be ready to be supplied to either the proposed *ad hoc* working group or the bureau. However, there remains the question of policy and how the CIPM wants to proceed.

Dr Steele commented that at the preliminary meeting held on 12 November 2018, immediately before the 26th meeting of the CGPM, and at the General Conference, his understanding had been that although the CIPM should address the situation, it should be careful of the limits of its authority, as some Member States had decided that the CIPM could keep the accumulated arrears and assign this to the BIPM. Other Member States had disagreed with this view as it would have an impact on their treaty dotations elsewhere, where the amounts of money involved are much more significant. The question is how the CIPM plans to address the situation: will it be addressed and finalized by the CIPM or will it be addressed and resolved via recommendations that will be voted on by the Member States.

The President suggested that the issue could be discussed initially by the bureau on 22 March 2019, which will make recommendations as to how the CIPM could proceed. A communication could then be sent out and a small *ad hoc* working group could be convened if required. The CIPM was reminded that the General Conference had not requested the CIPM to go back to it regarding this issue. The Director added that although this is indeed the case, it will expect a report on the outcomes.

Dr Steele reiterated that it was made clear, particularly at the preliminary meeting on 12 November 2018, that

certain Member States would not accept a situation if the CIPM decided to keep the accumulated arrears. He said that this is a core issue to determine what the CIPM is authorized to do on behalf of the Member States and what it can do on its own initiative. He added that if this is to be studied in the bureau, then there is no need to come back to the CIPM. He urged caution over questions related to the redistribution of money that has accumulated. The President agreed that caution is needed and said that it will be discussed at the bureau. He added that a firm proposal and plan of action will be brought to the next session of the CIPM; if any action is required before the next session, it will be dealt with by correspondence. The Director added that the problem of how to deal with arrears is a significant issue with many stakeholders. He commented that this is unlikely to be resolved before the next session of the CIPM in October 2019 and suggested that the bureau should develop a plan for how the problem will be analysed, addressed and a timetable established. Whether or not this should be undertaken by a small or large group will be considered at the next session of the CIPM in October 2019. The group will then be able to start work to decide its composition and to review the options for the necessary exchanges with the Member States. Dr Steele suggested that a useful early communication to the stakeholders would be a summary of the financial consequences that could be shared at the meeting of NMI Directors and Member State representatives in October 2019. This communication would be for information only and it would help to frame the size of the problem and to let the Member States know that the bureau has a plan and is addressing the issue with the CIPM as required in Resolution 5. This would send a signal that the CIPM is working on the problem in a positive way.

12. REFLECTIONS ON THE CIPM ELECTION PROCESS

The Director said that the discussion paper, which was to have been prepared by Dr May, had not been received. Although the content of the proposed paper was unknown, there was a view that it had been triggered by a need for better alignment between the criteria used by the CIPM to develop the proposed slate of candidates and the evaluation of the candidates by the Committee for CIPM Election (CEC). The criteria used by the CIPM to select the slate were proposed as one element that could be considered in the future. It was suggested that there should be a discussion with the CEC to agree common criteria. The President said that these points had been noted and the issue will be on the agenda for the next session of the CIPM in October 2019. Input will be sought from Dr May as well as the members of the CIPM, who have some insight into any shortcomings of the election process, now that they have participated in the process.

13. MEDIA REPORT

The Director reported that Ms Auty, the Rapporteur of the Task Group for the Promotion of the SI, had prepared a presentation on the work that it had completed. He noted that she had been responsible for bringing together the necessary inputs that had been vital in ensuring that the open session at the 26th meeting of the CGPM was a success. The Director commented that the Task Group had had a very broad coverage within the BIPM, the NMIs and the BIPM's liaison organizations.

Prof. Ullrich added that the four members of the PR Expert Group had done an outstanding job and that one of the beneficial outcomes from the work of the Task Group has been the development of good communications and a growing network between the press offices of the NMIs and it is hoped that this will continue to grow: the future of the PR Expert Group will be discussed in §18.

The Director presented some of the facts and figures relating to the promotional campaign for the revised SI:

- Countries and individuals all over the world took part in campaign.

- Hundreds of major articles were published in print, online, on the radio and television.
- More than 70 journalists were briefed by BIPM and more than 50 attended the conference.
- The open session was viewed online by 26 775 people with over 700 attending in person.
- The “Metric Makeover” video has been viewed 85 000 times in 12 different languages. The Director thanked NIST for producing the video.
- It is estimated that the story reached a global audience of more than 2 billion people.

He said that Ms Auty has recommended some further steps in the promotion of the SI. The sharing of resources and ideas through regular communications should continue; the group of PR experts within the NMIs is now closely linked and there is a specific group in EURAMET. The promotional campaign through to World Metrology Day (20 May) 2019 should continue and support for World Metrology Day should be encouraged. This support includes an initiative to have World Metrology Day adopted as the Google logo on 20 May 2019.

The Director said that the PR Expert Group has created a legacy that should be built upon. The NMI community has been actively promoting the SI and has proved that its PR departments can work together successfully in this area. It has created a large collection of resources and has created significant interest in the press about the SI. He suggested that it would be useful if the PR Expert Group could continue to have a role and be maintained as a focal point for sharing future opportunities within the global metrology community. It is suggested that the PR Expert Group could share the importance and role of measurement world-wide; provide input to ensure the vitality of World Metrology Day; support and share new large-scale profile-raising activities that are developed in the NMIs; and support the BIPM in raising its profile. The proposed terms of reference for a new “Promotional Group” were presented. The Director added that the proposal is that the PR Experts will continue to work together, without the task being an official CIPM activity. The PR Expert Group has proved that it is very effective at working autonomously.

Prof. Ullrich said that the promotion of the SI is now carried out routinely at the working level rather than at the CIPM level. He proposed that the CIPM Task Group for Promotion of the SI can be closed and the work of the PR Expert Group can be expanded. The PR Expert Group could be coordinated by BIPM staff. The President asked if there was agreement on this proposal. It was suggested that the CIPM should thank the CIPM Task Group for Promotion of the SI for the work that it has done, particularly that undertaken by the PR Expert Group. The decision should state that the CIPM clearly recognizes the need to continue with the work of the PR Expert Group. It was proposed that a representative from the PR Expert Group should participate in the meeting of the NMI Directors and Member State representatives, and possibly at JCRB meetings, where there are representatives from the RMOs. This would facilitate interaction and increased communication.

The President commented that the BIPM International Liaison and Communication (ILC) Department has an existing informal group that undertakes liaison for the CBKT programme. Each RMO has supplied this group with a contact person to work with the BIPM. There is therefore an ongoing informal arrangement that can be used as a point of contact with the PR Expert Group.

Decision CIPM/108-06 The CIPM thanked the members of the CIPM Task Group for Promotion of the SI and decided that it had successfully completed its tasks. It thanked the PR Expert Group and asked them to continue with their effective collaboration with the BIPM International Liaison and Communication Department and their coordination role with PR experts amongst National Metrology Institutes world-wide.

The President commented that the activities that required the presence of the outgoing members of the CIPM had been concluded and Dr Inglis and Dr McLaren left the meeting. There was a brief discussion on changes to the remaining agenda. It was suggested that a bullet point should be added to §18 to discuss the CIPM *ad hoc* Working Group on the Reproducibility of Research Data and Related Topics and that discussions on §20 “Preparations for the establishment of a WG for Member State representatives” should be brought forward to allow time for CIPM members to reflect on the issues overnight. The President proposed that the joint ILAC-CIPM communication should be on the agenda for 21 March to allow the CIPM Members to read the document overnight.

The CIPM was reminded that there should be a discussion on potential honorary members of the CIPM.

14. APPOINTMENT OF PRESIDENTS FOR THE CCQM AND CCTF

The Director said that a document “*Guidelines for selection of CIPM Consultative Committee Presidents, CC Working Group Chairpersons, and Working Group Deputy Chairpersons*” is available on the CIPM webpages. This document lays down the attributes and qualifications for a CC President and requires candidates to make a presentation to the CIPM to explain how they meet the criteria and experience. There were two vacant roles, with one candidate for the Presidency of the CCQM and two for the Presidency of the CCTF. Dr Park, KRIS (Republic of Korea), the sole candidate for the Presidency of the CCQM, made a presentation to the CIPM and was appointed unanimously for a four-year term.

Decision CIPM/108-07 The CIPM appointed Dr S.-R. Park as the President of the Consultative Committee for Amount of Substance: Metrology in Chemistry and Biology (CCQM) for a four-year term.

The two candidates for the vacant role of CCTF President made their presentations and this was followed by a secret ballot. Dr Dimarcq, Observatoire de la Côte d’Azur (France) was appointed as the President of the CCTF for a four-year term.

Decision CIPM/108-08 The CIPM appointed Dr N. Dimarcq as the President of the Consultative Committee for Time and Frequency (CCTF) for a four-year term.

15. CONFIRMATION OF INCUMBENT CC PRESIDENTS

The CIPM President asked the Presidents of the other CCs if they were willing to continue in the role for another four-year term. They all responded that they would continue, with the proviso that Dr Louw (CCRI President) and Dr Usuda (CCAUV President) would consider their positions now that they have been elected as CIPM President and Secretary respectively. Both Dr Louw and Dr Usuda indicated that they were available to serve as Presidents at the next scheduled meetings of their CCs (CCRI in June 2019 and CCAUV in September 2019) for the sake of continuity. The CIPM President said that this issue would be brought back to the CIPM either on 21 March 2019 or at its next session in October 2019. It was suggested that if either Dr Louw or Dr Usuda intended to step down, they should announce this decision as soon as possible.

Dr Usuda subsequently announced on 21 March that although he would chair the next meeting of the CCAUV on 23 to 27 September 2019, he will reconfirm his position at the next session of the CIPM in October 2019 if any candidates come forward to take on the role of CCAUV President.

Dr Steele suggested that the process for reappointing existing CC Presidents could be improved as there is a perceived difference between electing new Presidents and re-appointing the incumbent Presidents, with the reappointments appearing to be much less formal. The reappointment mechanism could be made to be more official, so that the process is not perceived as simply being a default reappointment of the incumbents; it is a joint decision by the CIPM with a new mandate to support the CC Presidents who have done a good job and are willing to continue for another four years. In the spirit of transparency and collective participation by the CIPM, this would make it clear that reappointing CC Presidents is not simply an automatic process. Prof. Ullrich suggested that, in the future, an election process could be held for each CC President role in case there are any other candidates that would like to be considered for the next four-year term. The Director noted that the *Guidelines for Selection of CIPM Consultative Committee Presidents and Consultative Committee Working Group Chairpersons and Working Group Deputy Chairpersons* include a reappointment procedure, which may need to be revised. The President noted that this procedure had been followed for the reappointments.

The CIPM thanked the Presidents of the Consultative Committees for their work and the quality of their reports to the 26th meeting of the CGPM and formulated the following decision.

Decision CIPM/108-09 The CIPM thanked the Presidents of the Consultative Committees for their work and their excellent reports to the 26th meeting of the CGPM. It decided to reappoint the Presidents of the following Consultative Committees for four-year terms:

- Consultative Committee for Acoustics, Ultrasound and Vibration (CCAUV): Dr T. Usuda.
- Consultative Committee for Electricity and Magnetism (CCEM): Dr G. Rietveld.
- Consultative Committee for Length (CCL): Dr I. Castelazo.
- Consultative Committee for Mass and Related Quantities (CCM): Dr P. Richard.
- Consultative Committee for Photometry and Radiometry (CCPR): Dr M.L. Rastello.
- Consultative Committee for Ionizing Radiation (CCRI): Dr W. Louw.
- Consultative Committee for Thermometry (CCT): Dr Y. Duan.
- Consultative Committee for Units (CCU): Prof. J. Ullrich.

16. REPORTS FROM THE CC PRESIDENTS

Consultative Committee for Electricity and Magnetism (CCEM)

Dr Rietveld, CCEM President, said that since the 107th meeting of the CIPM in June 2018 the CCEM had presented its report and poster at the 26th meeting of the CGPM. During this period the CCEM promoted the draft *mise en pratique* for the ampere and other electric units in the SI as well as the “*CCEM Guidelines for Implementation of the Revised SI*”. The promotion of these documents was carried out to give advice on the small step-changes in voltage and resistance measurements and related derived quantities following the redefinition of the ampere. In addition, the CCEM completed the update of its CMC categories and has provided support to the development of the KCDB 2.0.

The CCEM provided input into the joint BIPM-NIST workshop on “future-proofing” the SIR by using new electrical current measurement technology, which is a CCRI initiative. The CCEM supports the proposal for a joint Working Group on improved low-current measurements for ionization chambers.

Dr Rietveld said that in his role as President of the CCEM he has appointed two new Working Group Chairs: Mr di Lillo, INTI (Argentina) as Chair of the CCEM Working Group for RMO Coordination (CCEM-WGRMO) and Dr Early, MSL (New Zealand) as Chair of the CCEM Working Group on Low-Frequency Quantities (CCEM-WGLF). Two Working Groups that were related to the revision of the SI have completed their tasks and have been closed: the CCEM Working Group on Electrical Methods to Monitor the Stability of the Kilogram (CCEM-WGKG) and the CCEM Working Group on Proposed Modification to the SI (CCEM-WGSI). To provide ongoing CCEM input in these areas, there will be CCEM representation at the proposed new CCM Working Group on the kilogram.

CMI (Czechia) has applied to become a Member of the CCEM and three NMIs will send observers to the next meeting of the CCEM (March 2019) for the first time: EMI (United Arab Emirates), IPQ (Portugal) and SASO (Saudi Arabia).

Consultative Committee for Mass and Related Quantities (CCM)

Dr Richard, CCM President, began by recalling that the CCM covers the areas of mass, force, torque, pressure, vacuum, density, viscosity, hardness, fluid flow and gravimetry. He presented the CCM Roadmap and commented that the final milestone will be reached with the implementation date of the revised SI on World Metrology Day 2019 (20 May); the next meeting of the CCM will be held immediately before this on 13 to 17 May 2019.

Dr Richard said that since the 107th meeting of the CIPM in June 2018 the CCM gave its report at the 26th meeting of the CGPM and has published a *Metrologia* focus issue on *Realization, Maintenance and Dissemination of the Kilogram*². In addition, the CCM approved the *mise en pratique* for the definition of the kilogram in the SI and supplied information for users about the proposed revision of the SI. The CCM Task Group on the Phases for the Dissemination of the kilogram following redefinition (CCM-TGPfD-kg) was very active during the period.

The 17th meeting of the CCM (13 to 17 May 2019) will approve the note on the Phases for the Dissemination of the kilogram following the redefinition and a workshop will be held on new activities in the field of Mass and Related Quantities. The CCM Working Group on the Realization of the kilogram (CCM-WGR-kg) and the CCM Working Group on the Dissemination of the kilogram (CCM-WGD-kg) will be merged into a single new Working group on the kilogram. This new working group will be open to the CCEM for discussions on the Kibble balance.

Consultative Committee for Units (CCU)

Prof. Ullrich, CCU President, said that the CCU had not met since 2018. Its next meeting is scheduled for 8 to 9 October 2019. A BIPM Workshop on *Advanced Time and Frequency Transfer (ATFT): the ultimate frontier for remote comparison methods* will be held on 10 October 2019. This workshop is being organized jointly by the CCTF Working Group on Advanced Time and Frequency Transfer Techniques (CCTF-WGATFT) and the CCU. The discussion topics and the featured speakers proposed by the CCU for the workshop were presented. Since the last meeting of the CIPM in June 2018 the CCU had reported to the 26th meeting of the CGPM.

The development of the CCU strategy for 2019-2030 has been carried out by the CCU Working Group on

² <https://dx.doi.org/doi:10.1088/0026-1394/53/5/A1>

Strategy (CCU-WG-S), which was set up in September 2017. The CCU-WG-S held its latest meeting in January 2019, where its terms of reference were developed; these are awaiting approval by the CCU.

Prof. Ullrich gave an update on progress with the 9th edition of the SI Brochure. The final draft is now available on the BIPM website (dated 6 February 2019). It includes a Preface (co-signed by the CIPM President, the CCU President and the BIPM Director), an updated Appendix 1 and a new list of acronyms. The translation into French has been completed by the BIPM and is being reviewed externally.

Consultative Committee for Acoustics, Ultrasound and Vibration (CCAUV)

Dr Usuda, CCAUV President, said that the CCAUV has 18 members and 12 observers. It has a permanent liaison with the International Electrotechnical Commission (IEC) and the International Organization for Standardization (ISO). Discussions have started with the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) with regard to the International Monitoring System (IMS).

Dr Usuda mentioned the governance of the CCAUV, noting that it has three Working Groups: the CCAUV Working Group for Key Comparisons (CCAUV-KCWG), the CCAUV Working Group for RMO Coordination (CCAUV-RMOWG) and the CCAUV Working Group on Strategic Planning (CCAUV-SPWG). The CCAUV Strategy 2017 to 2027 was adopted and published at the plenary meeting, which was held in September 2017. It will be reviewed and amended at 12th meeting of the CCAUV to be held on 23 to 27 September 2019. The agenda for this meeting was presented. He commented that the CCAUV planning process for Key Comparisons (KCs) involves careful deliberation to optimize the resource requirements that are needed to respond to the needs of its stakeholders; repeat KCs are planned according to a ten-year cycle.

The future subjects that will be pursued by the CCAUV include further discussions with the CTBTO; these discussions will include the BIPM and the CIPM. Joint activities with other Consultative Committees will be developed including dynamic mechanical/dimensional quantities with the CCM and CCL; phase-shift evaluation on propagation of acoustic waves in different media employing optical methods with the CCPR; and physiological and exposure effects on the human body with the CCQM.

Consultative Committee for Time and Frequency (CCTF)

Dr Tavella, CCTF Executive Secretary, gave a presentation on behalf of the outgoing CCTF President, Mr Énard, and the incoming President, Dr Dimarcq, covering the period since the last meeting of the CIPM in June 2018. She recalled that Resolution 2 “On the definition of time scales”, which is aimed at defining the reference time scales, had been adopted at the 26th meeting of the CGPM in November 2018. Coordinated Universal Time (UTC) and International Atomic Time (TAI) have been widely adopted as reference time scales but had never been clearly defined. Resolution 2 addresses this problem and includes clear definitions.

Dr Tavella said that optical secondary frequency standards developed by SYRTE and NICT are now being used in the steering of UTC. They entered into the steering of TAI in 2018. In 2019 a new secondary frequency standard, developed by NIST, will be used for the first time. The move towards the use of secondary frequency standards is in anticipation of the future redefinition of the second.

The CCTF operates one key comparison (CCTF-K001.UTC) for the calculation of the reference time scale UTC. However, a new supplementary comparison (GULFMET.TF-S1) has been started by GULFMET; it is a bilateral comparison of the time difference between two pulses. Dr Tavella noted that a series of additional supplementary comparisons, proposed by the RMOs are under evaluation.

Future challenges for the CCTF include the redefinition of the second, which will require very good primary and secondary frequency standards as well as very good time and frequency transfer. For this purpose the

CCTF has collaborated with the CCU to organize the BIPM Workshop on *Advanced Time and Frequency Transfer (ATFT): the ultimate frontier for remote comparison methods*.

Consultative Committee for Length (CCL)

Dr Castelazo, CCL President, said that the CCL has 24 members and four observers. It held its last meeting on 14-15 June 2018 and the next meeting is scheduled for 2021. The CCL Working Group on the CIPM MRA (CCL-WG-MRA) will meet on 17-18 October 2019 in conjunction with the NanoScale 2019 conference, which will be held at the PTB (Germany) on 15-16 October 2019.

Since the 107th meeting of the CIPM in June 2018 the CCL provided support to the 26th meeting of the CGPM through the CCL President's report, a poster and a report on its activities. The CCL strategic plan and a Summary document were published on the BIPM website in 2018. The strategic plan follows the new format proposed by the CIPM.

Dr Castelazo commented that the *mise en pratique* for the definition of the metre has been developed by the CCL Working Group chairs and it is now in its final form. There had not previously been a *mise en pratique* for the metre on the BIPM website; instead there was a list of frequencies that were used to realize the metre. The *mise en pratique* will include concepts such as 'time of flight' and interferometry. The document is ready for consideration by the CIPM.

The ISO Technical Committee ISO/TC 213: *Dimensional and geometrical product specifications and verification* has approved the creation of an external liaison with the CCL and has appointed Dr Balsamo, INRIM (Italy) as the Liaison Officer to the CCL.

Dr Milton said that developing the *mise en pratique* for the metre is a significant step for length metrology. He commented that experts understood that the wavelengths were able to realize the metre but for the outside world it is necessary to present a system that explains how to realize the metre in practice. The CCL Working Group chairs have produced a useful document and this significant achievement should be acknowledged.

Consultative Committee for Photometry and Radiometry (CCPR)

Dr Rastello, CCPR President, commented that she has been President of the CCPR since January 2017. The structure of the CCPR was presented for the benefit of new CIPM members; it has 23 members, three observers and two liaisons: the International Commission on Illumination (CIE) and the World Meteorological Organization (WMO). The CCPR operates three Working Groups: the CCPR Working Group on CMCs (CCPR-WG-CMC); the CCPR Working Group on Key Comparisons (CCPR-WG-KC); and the CCPR Working Group on Strategic Planning (CCPR-WG-SP). The Chairs of each Working Group were presented. The CCPR Working Groups met at the BIPM on 2-4 July 2018 and the next meeting of the CCPR and its Working Groups will be held at the BIPM on 16-20 September 2019.

The CCPR has made progress with implementing the findings of the review of the CIPM MRA. Guidance is now available on the evidence to support CMCs that are not covered by a comparison; guidance tools are available for comparisons and CMCs; "silent" comparisons are addressed systemically every year; and a policy on open access to CC documents has been implemented.

Dr Rastello recalled that the *mise en pratique* for the definition of the candela had been published in *Metrologia* in May 2016³. She commented that the CCPR is close to finalizing a new version of the *mise en pratique* according to the format proposed by the CIPM. There are still issues to resolve as the *mise en*

³ <https://metrologia.bipm.org/guides-stds-conventions/2016/G1.pdf>

pratique of the candela is dependent on the realization of recommended units. In addition, the CCPR is ready to publish a joint publication with the CIE entitled *Principles Governing Photometry*.

Consultative Committee for Thermometry (CCT)

Dr Duan, CCT President, recalled that the latest news from the CCT had been reported at the 26th meeting of the CGPM. He said that the draft *mise en pratique* for the definition of the kelvin in the SI consists of a main text that is supported by a set of appendices that cover realization methods including acoustic gas thermometry, dielectric constant gas thermometry, radiation thermometry, refractive-index gas thermometry and Johnson noise thermometry. The paper related to refractive-index gas thermometry, which will constitute one of the supporting appendices, has been accepted for publication in *Metrologia*.

The TEMPMEKO 2019 conference, which will be held in Chengdu (China) on 10-14 June 2019, will host meetings of several CCT Working Groups and Task Groups.

Dr Duan concluded by saying that the next meeting of the CCT is scheduled for 23-27 March 2020.

Consultative Committee for Amount of Substance: Metrology in Chemistry and Biology (CCQM)

Dr Park, the incoming CCQM President, announced that the CCQM will celebrate its 25th anniversary at its meeting on 6 to 12 April 2019. The meeting will include a CCQM Workshop on Advances in Metrology in Chemistry and Biology on 10 April. The Director added that the workshop will include a poster competition and a Focus Issue of *Metrologia*⁴ is planned, for which around 50 papers have been submitted. The workshop will be streamed live on YouTube and the video will be available on the BIPM website.

Consultative Committee for Ionizing Radiation (CCRI)

Dr Louw, CCRI President, said that the discussions with the *Autorité de sûreté nucléaire* (ASN) regarding the licence to keep radioactive sources at the BIPM have been very constructive. He thanked the BIPM Director and the Director of the Ionizing Radiation Department, Dr Judge, for their hard work in progressing this issue and observed that a positive outcome is expected.

Discussions are ongoing with the IAEA with regard to how services are provided, particularly to the developing world. Dr Louw noted that the discussions have been interesting and constructive and that the outcomes will be communicated to the CIPM.

Dr Louw said that the next meeting of the CCRI will be held on 3-7 June 2019. He recalled that the duration of CCRI meetings, including the sections and plenary session, has been reduced from one month to five days. The meeting in June 2019 will operate parallel section meetings for the first time.

The CCRI is considering how to proceed with the outcome of the joint BIPM-NIST workshop on “future-proofing” the SIR using new electrical current measurement technology, as described previously by the CCEM President. Low-current measurements from ionization chambers may be investigated as a CCRI activity, with participation from the CCEM, although discussions are ongoing.

Dr Louw said that the CCRI has sent its draft strategy document to all members and section members for comment. A short workshop will take place on the afternoon before the plenary session of the CCRI meeting in June 2019 to discuss the strategy document. The main item addressed by the strategy document is how to

⁴ https://iopscience.iop.org/journal/0026-1394/page/Focus_on_advances_in_metrology_in_chemistry_and_biology

deal with the comprehensive or “core” CMCs. A proposal is now on the table and EURAMET is piloting this scheme and discussions are ongoing. The CCRI has finalized its service categories for the KCDB 2.0 and is preparing to have its comprehensive and matrix-type CMCs included.

17. APPOINTMENT OF CHAIRS FOR THE PENSION FUND ADVISORY BOARD (PFAB) AND THE AD HOC WORKING GROUP ON CONDITIONS OF EMPLOYMENT

The President recalled that the Chairs of the PFAB, Mr Énard, and the *ad hoc* Working Group on Conditions of Employment, Dr McLaren, had stepped down from the CIPM and consequently both roles were vacant. Following a discussion on the workload and responsibilities of each role, Dr Steele volunteered as the Chair of the PFAB and Dr Usuda volunteered to take over as Chair of the *ad hoc* Working Group on Conditions of Employment. They were subsequently appointed by the CIPM.

Decision CIPM/108-10 The CIPM appointed Dr A. Steele as the Chair of the Pension Fund Advisory Board (PFAB).

Decision CIPM/108-11 The CIPM appointed Dr T. Usuda as the Chair of the CIPM *ad hoc* Working Group on Conditions of Employment.

18. APPOINTMENT OF MEMBERS TO THE CIPM SUB-COMMITTEES AND AD HOC WORKING GROUPS AND REVIEW OF TERMS OF REFERENCE

The President went through the vacancies on the six CIPM Sub-Committees and *ad hoc* Working Groups that had become available and called for CIPM members to volunteer for the various roles. The new composition of the CIPM Sub-Committees and *ad hoc* Working Groups are indicated in Decision CIPM/108-12 (newly-appointed members are shown in bold).

Decision CIPM/108-12 The CIPM appointed the following CIPM members to serve on the CIPM Sub-Committees and *ad hoc* Working Groups:

- CIPM Sub-Committee on Finance: Dr M. Sené (Chair), Dr Y. Duan, Dr W. Louw, Dr P. Richard, **Dr T. Usuda**.
- Pension Fund Advisory Board (PFAB): **Dr A. Steele** (Chair), Dr M. Sené (Chair of the CIPM Sub-Committee on Finance), Dr T. Usuda.
- CIPM Sub-Committee on Strategy: Dr M. Milton (Chair), **Dr D. del Campo Maldonado**, Dr T. Liew, **Dr W. Louw**, **Prof. P. Neyezhmakov**, **Dr J. Olthoff**, Dr M.L. Rastello, Dr G. Rietveld, **Dr A. Steele**, Prof. J. Ullrich.
- CIPM *ad hoc* Working Group on Conditions of Employment: **Dr T. Usuda** (Chair), Dr I. Castelazo, **Dr M.L. Rastello**, **Dr P. Richard**.
- CIPM Sub-Committee on Awards: Dr F. Bulygin (Chair), Dr T. Liew, **Dr S. R. Park**.
- CIPM *ad hoc* Working Group on the Reproducibility of Research Data and Related Topics: Dr T. Liew (Chair), Dr F. Bulygin, Dr I. Castelazo, Dr H. Laiz, Dr M.L. Rastello, Dr M. Sené, **Prof. J. Ullrich**.

Establishment of a CIPM Task Group on “unit” (Decision CIPM/107-13)

Prof. Ullrich recalled that Decision CIPM/107-13 called for the establishment of a CIPM Task Group to review further the issue concerning the definition of the term “unit” in the SI Brochure⁵. He recalled that there had been a decision in the CCU on the definition of the term “unit” and the CCU will pursue this and other outstanding issues such as radian and cycle in its upcoming meetings to come to conclusions. He suggested that one outcome from that discussion is that there should be better coordinated input from the CIPM into the JCGM and its Working Groups; the proposed CIPM Task Group could carry out this task. At present there is no structured input from the CIPM into JCGM WG1 and WG2 whereas the “mirror” communities in organizations such as ISO and the OIML have input into the JCGM Working Groups. A second concern is that there are important definitions for establishing the SI and for the dissemination of units such as unit, measurement and traceability, which are being decided as “terminology” within the JCGM. As a result he proposed that the scope of any CIPM Task Group on “unit” should be expanded to include other terms and this could be reflected in the terms of reference. Prof. Ullrich commented that the definition of unit should be discussed, in addition, within the CCU.

The President summarized by saying that the proposal is to set up a Task Group that consists of members of the CIPM to discuss the issue and to report back to the CIPM. The Director commented that the BIPM is one of the eight member organizations of the JCGM and he asked Prof. Ullrich how the proposed Task Group would feed into the JCGM and JCGM WG2 in particular. Prof. Ullrich suggested that there could be an expert group within the Task Group that could formulate a “CIPM opinion” that could be transferred in the same way that ISO feeds its opinion into the JCGM Working Groups. The Director asked if a member of the CIPM Task Group would represent the CIPM at meetings of the JCGM. Prof. Ullrich replied that his expectation was that a member of the CIPM Task Group would attend the JCGM.

Dr Steele said that a core question that has already been decided is about the specific Task Group on “units” to mirror activities within the CCU. He added that there remains a broader question on how the CIPM engages more formally in other areas. One proposal is to create a mirror Task Group that will simply consider units and see how this works at a higher level of governance. This is being carried out against the guise of a coordinated

⁵ For further details see §13 of the Proceedings of the 107th meeting of the CIPM (2018)

and collective opinion being provided to one or both of the JCGM Working Groups. However, although the membership of the JCGM includes the BIPM Director, CIPM representation on JCGM WG1 and WG2 requires reflection. The Director said that JCGM WG1 includes three experts appointed by the BIPM: Dr Cox, Dr Estler and Dr Nielsen, who represent the organization. It has not been possible to reproduce this model of knowledgeable individuals from the CC community, with a deep understanding of terminology that could represent the BIPM at JCGM WG2. The Director reiterated that representation on WG2 does not necessarily have to be drawn from within the CIPM. Dr Steele endorsed the suggestion raised by Prof. Ullrich for the Task Group on “unit” to revisit outstanding issues and that there should be more active participation in JCGM WG2.

The President called for volunteers to serve on the CIPM Task Group on “unit” who can address many of the issues on behalf of the CIPM and who could attend JCGM WG2 to facilitate transfer of information. Dr Bulygin, Dr Castelazo, Dr Laiz, Prof. Neyezhnikov, Dr Steele and the Director of the BIPM volunteered. Prof. Ullrich was appointed as the Chair. Following a discussion concerning differentiation of the roles of the CIPM Task Group on “unit” and the CCU, it was agreed that terms of reference would be developed by the Task Group at its first meeting. These terms of reference will be presented to the next session of the CIPM in October 2019.

It was asked if there is a representative from the BIPM in the ISO Technical Committee that “mirrors” the CCU. The Director clarified that the relevant ISO TC is a liaison to the CCU and the CCU has the right to send a representative to the ISO TC; an offer to carry out this liaison role has been received from an individual from one of the NMIs. Dr Steele recalled that the CCU underwent a recent change in its membership structure, with some of its members becoming liaisons. He opined that the CCU is the CC that is most affected by the liaison status and this may be an appropriate way to find experts for the CIPM Task Group on “unit”; the CCU could identify experts.

Decision CIPM/108-13 Following Decision CIPM/107-13, the CIPM confirmed the establishment of the CIPM Task Group on “unit” and asked the Chair to propose terms of reference to the next meeting of the CIPM that address the comments of CIPM members regarding the expansion of its scope. It appointed Prof. J. Ullrich as the Chair. Drs F. Bulygin, I. Castelazo, H. Laiz, A. Steele, Prof. P. Neyezhnikov and the Director of the BIPM were appointed to be members.

During the subsequent review of Decision CIPM/108-13 on 21 March, Dr Sené said that the minutes should record that the CIPM had expressed concern that there should be appropriate representation on JCGM WG2 as it is not mentioned in the decision. Prof. Ullrich asked for confirmation as to whether the Task Group had been asked to come up with a proposal for appropriate representation on WG2. Dr Steele added that the issue went deeper than representation on JCGM WG2; it is part of the wider issue of “mirroring” of CIPM interaction with liaison organizations to ensure broader and appropriate representation. He recalled that the debate on how members were selected to join Working Groups had expanded into the area of the changing relationships, now that the liaison members of the CCU are no longer members. He opined that the CIPM could expand the mandate for the CIPM Task Group on “unit” to investigate who could be appointed as an expert to different Working Groups. The decision does not address who should be a representative expert on JCGM WG2. Another area that needs to be explored is how appropriate representation to the liaisons is achieved, now that the CIPM Task Group on “unit” has been formed.

The President said that this could be a discussion point for the future. Dr Olthoff said that there has to be a basic assumption that when the CIPM appoints a representative to a committee, by default it is to provide appropriate representation. Dr Steele replied that a representative has been appointed to the JCGM but not JCGM WG2, so this is an area of representation that has been lost. Prof. Ullrich suggested that the mandate for the CIPM Task Group on “unit” could include a recommendation to make a proposal to the CIPM on representation to JCGM WG2.

CIPM *ad hoc* Working Group on the Reproducibility of Research Data and Related Topics

Prof. Ullrich proposed that the scope of this *ad hoc* Working Group could be expanded and he asked if any of the new members of the CIPM were interested in joining, noting that he himself wished to join. Prof. Ullrich said that it would be useful if the expanded scope could incorporate work towards developing machine-readable versions of the SI Brochure and ultimately the Guide to the Expression of Uncertainty in Measurement (GUM) and the International Vocabulary of Metrology (VIM). He noted that there is an ongoing European Metrology Programme for Innovation and Research (EMPIR) project in the area of machine readability.

Dr Steele asked if the digitization of existing documents, such as the SI Brochure, would be better dealt with under the scope of the PR Expert Group, as this is a different issue to the fidelity, traceability and reproducibility of experimental data and associated open-science questions, which are the responsibility of the *ad hoc* Working Group. He suggested that investigating the machine readability of the SI Brochure has more to do with improving the accessibility of the brochure and this is a promotional task. Prof. Ullrich replied that producing a machine-readable SI Brochure goes beyond the remit of the PR Expert Group. Producing a machine-readable brochure would require consultation with other organizations such as ISO and ILAC to ensure commonality and usability. He clarified that the PR Expert Group consists of communication experts.

Dr Sené suggested that the first task of the *ad hoc* Working Group should be to investigate the significant number of related topics that emanate from the challenge faced by metrology as a result of the “second digital revolution”. He recalled the workshop on “Improving Reproducibility in Research: The Role of Measurement Science” held at the NPL (UK) on 1-3 May 2018, which provided the impetus to set up the CIPM *ad hoc* Working Group on the Reproducibility of Research Data and Related Topics. As well as reproducibility of data, a vast range of related topics came out of this workshop, all of which need to be investigated in terms of where metrology can have an impact. The process of scoping this problem is only just beginning and it may be that the scope is too large to be handled by one *ad hoc* Working Group.

The President asked Dr Liew, the Chair of the CIPM *ad hoc* Working Group on the Reproducibility of Research Data and Related Topics, to develop terms of reference for the *ad hoc* Working Group and to report back to the next session of the CIPM in October 2019. Dr Liew confirmed that the terms of reference will be finalized on 22 March 2019 and that the issues raised will be discussed. He added that the *ad hoc* Working Group is not yet permanent and that it will identify and prioritize areas where it will be able to make an impact. Dr Liew will report the *ad hoc* Working Group’s recommendations to the CIPM.

Decision CIPM/108-14 The CIPM charged Dr T. Liew to draft terms of reference for the CIPM *ad hoc* Working Group on the Reproducibility of Research Data and Related Topics taking into account the comments of CIPM members regarding the expansion of the mandate and to present them to the next meeting of the CIPM.

19. APPOINTMENT OF CIPM REPRESENTATIVES TO THE JCRB, JCTLM AND JCGM

The President said that there were vacancies for CIPM representatives to the Joint Committee of the Regional Metrology Organizations and the BIPM (JCRB), the Joint Committee for Traceability in Laboratory Medicine (JCTLM) and the Joint Committee for Guides in Metrology (JCGM) and called for volunteers. It was noted that document CIPM MRA-D-01 “*Rules of procedure for the JCRB*” states in §3.4 that the “Secretary of the

CIPM represents the CIPM in the Joint Committee.” The JCRB will be asked agree that the link between the CIPM and the JCRB does not necessarily have to be via the CIPM Secretary.

The newly appointed representatives are shown in Decisions CIPM/108-15 to CIPM/108-17.

Decision CIPM/108-15 The CIPM appointed Dr J. Olthoff to represent the CIPM at the Joint Committee of the Regional Metrology Organizations and the BIPM (JCRB) and asked the JCRB to amend document CIPM MRA-D-01 “Rules of procedure for the JCRB” as necessary.

Decision CIPM/108-16 The CIPM appointed Dr T. Liew to represent the CIPM at the Joint Committee for Traceability in Laboratory Medicine (JCTLM) and Dr S.-R. Park as deputy.

Decision CIPM/108-17 The CIPM appointed Prof. P. Neyezhnikov to represent the CIPM at the Joint Committee for Guides in Metrology (JCGM).

20. LIAISON WITH ILAC

Mr Henson said that a key output from the bilateral meeting with ILAC in March 2019 had been a consensus that the review of the 2005 *Joint statement by the CIPM and ILAC on improving world-wide traceability and acceptance of measurements carried out within the CIPM MRA and the ILAC arrangement* is not sufficiently advanced to bring to the CIPM. The bilateral meeting in 2018 had proposed a “light” review to update references and to align with the revised ISO/IEC 17025. However, the document had subsequently been found to require a more thorough review, as the language used reflects the age of the document. The document is widely used in developing countries to describe the verticality of the traceability chain and in discussions with governments when setting up an appropriate accreditation structure. It is proposed that rather than abandoning the document, consideration will be given to developing a conceptual approach. If this can be agreed at the March 2020 bilateral meeting, the following period will be dedicated to rewriting the document. Prof. Ullrich added that although the joint statement is not highly regarded by ILAC, it covers the national organization of accreditation and is based on a CIPM decision and a CGPM Resolution. A way should be found to phrase the joint statement so that it can gain acceptance by ILAC, while retaining the basic information that is important to the BIPM. Mr Henson said that he will continue to stress to ILAC the importance of the document and that the CIPM wishes to make progress with the review through informal dialogue with ILAC.

A second document “*Joint ILAC – CIPM Communication regarding the Accreditation of Calibration and Measurement Services of National Metrology Institutes*” has been revised and requires formal approval by the CIPM (and ILAC). This revised guidance document covers the accreditation of NMIs and it is intended for the accreditation community. It is important to the accreditation community, particularly in the APMP region, where 50 % of bodies that carry out accreditation of NMIs directly use the document. The revisions included an update of the references to incorporate the revised standard ISO/IEC 17025:2017 “*General Requirements for the competence of testing and calibration laboratories*” and the new standard ISO 17034:2016 “*General requirements for the competence of reference material producers*”; updated text to accommodate CIPM MRA process changes that resulted from the review of the MRA; and removal of reference to CIPM paper CIPM/2007-25. The other significant change was the inclusion of GULFMET in the list of RMOs in the document; GULFMET did not exist when the original document was written. He noted that the changes had previously been agreed in 2018 and were confirmed at the BIPM/ILAC bilateral meeting, held on 18 March 2019. The revised document had been made available on the BIPM website, along with a briefing note

explaining the background to the changes.

There was a discussion as to whether the revised *Joint ILAC – CIPM Communication* would have been an appropriate working document for the JCRB to discuss at its meeting in March 2019. It was clarified that the document had in fact been mentioned at the JCRB meeting. The broader issue of what comes under the remit of the CIPM and the liaison between the CIPM and ILAC was raised, with reference to the review of this document and ILAC P10:01/2013. It was suggested that the nature of engagement could be reviewed; waiting for documents to be approved by the CIPM had led to previous difficulties in gaining acceptance of documents at the JCRB and at the NMI level in the RMOs. It was noted that the JCRB had indicated that it agreed with the *Joint ILAC – CIPM Communication* and that the changes were straightforward. It is used as a basic working document, particularly in APMP, and it does not include any requirements on the BIPM. The revised document had been brought to the attention of the JCRB at its last meeting and the principles behind the proposed changes had been discussed previously and had been implemented in the working document. Prof. Ullrich added that the present version of the *Joint ILAC – CIPM Communication* included a correction to the use of the term “Member States”, which had been previously referred to as “Member States of the Metre Convention” and “Members of the BIPM” within the same document. In view of the ongoing clarification process on this issue that shall be addressed by a Working Group of Member State representatives, it was agreed to just use the neutral expression “Member States” without any further specification as used in the revised document.

The President said that the revisions to the *Joint ILAC – CIPM Communication* were clear and that it has been brought up to date. Clarification of the use of the term “Member States” was welcomed. There was support for the changes, although the concern was raised again that the document could have been shared in its draft and improved form to enable other stakeholders from the JCRB community to endorse the changes to inform the CIPM’s decision making process. The President said that the chair of the JCRB will be consulted about the sharing of documents during the drafting stage.

The revised *Joint ILAC – CIPM Communication* was approved.

Decision CIPM/108-18 The CIPM approved the revisions to the “Joint ILAC – CIPM Communication regarding the Accreditation of Calibration and Measurement Services of National Metrology Institutes”.

Dr Laiz suggested that the CIPM’s relationship with ILAC could be discussed by the bureau, particularly with regard to the way it engages with the RMO Presidents. Formal engagement by the NMIs and RMOs in the relationship with ILAC is needed so that they are included in decisions relating to documents such as ILAC P10:01/2013 “ILAC Policy on Traceability of Measurement Results”. He was of the opinion that documents such as this strongly influence the work of the NMIs in their countries. Mr Henson recalled that the drafting of ILAC P10:01/2013 had been consulted through the RMOs in two rounds before it was finalized, but it had not been possible to reach consensus within the metrology community. The JCRB recorded at the time that there had been a variety of views and that these views should be represented. This position was supported by a CIPM decision. ILAC pursued a route that was not considered by all parties to have been correct. This position was carried through to the drafting of ISO/IEC 17025:2017. Mr Henson noted that he had worked to avoid calibration being classed as a “conformity assessment activity” *per se* in ISO/IEC 17025:2017. He added that now ILAC P10 is being revised, two major concerns have arisen from the discussions within ILAC AIC⁶ WG Metrology concerning the first draft:

- The switch to the term ‘conformity assessment bodies’: ILAC favoured generalizing the document replacing ‘laboratories’ with ‘conformity assessment bodies’ (because inspection bodies are not

⁶ ILAC Accreditation Committee (ILAC AIC)

laboratories). For calibration laboratories this would be in contradiction with Resolution 11, 22nd CGPM (2003), which states that calibration is not a conformity assessment activity' and is also at odds with the CIPM Position paper for the revision of ISO/IEC 17025 revision (doc CIPM/15-04) in which the CIPM position is: 'To avoid calibration being classed as a "conformity assessment activity" *per se*'. The BIPM has made representation to AIC WG Metrology and as a consequence the draft has been amended and the term 'conformity assessment bodies' has been changed to 'accredited bodies'.

- The perceived 'hierarchy' in the current version of ILAC P10 which results from the treatment of so called 'Route 1' and 'Route 2' for traceability (CIPM MRA and ILAC MRA), with a third route (3a and 3b for NMIs operating outside the CIPM MRA and other accredited labs outside the ILAC MRA respectively) in which the evidence for traceability is examined by the accreditation body. ILAC P10 states 'so these routes [3a and 3b] should only be applicable when 1) or 2) are not possible for a particular calibration'. Although the wording is 'should' not 'shall', when taken as a whole, Routes 1 and 2 have become a *de facto* requirement in some countries. The NMIs providing national services outside of the CIPM MRA believe the choice of metrological traceability route should be decided by the laboratories, not the accreditors, and that P10 goes beyond the ISO standard. Concern centres on interpretations, which under the current P10 policy could steer customer laboratories away from their services, or even be in conflict with the law. The BIPM has made a representation to AIC WG Metrology, and as a consequence in the current draft of the revised P10, this 'hierarchy' statement has been dropped.

Mr Henson added that although the BIPM is a liaison at ILAC meetings, it does not have a vote; the vote on ILAC P10 will be taken by the accreditation community. The President noted that the CIPM members have a good working relationship with their regional and national accreditation bodies and he urged them to discuss this issue with the accreditation bodies to encourage a positive outcome.

A brief discussion concluded that intervention by the BIPM to offset these proposed changes to ILAC P10 was essential. The opinion of the CIPM is that ILAC should not propose changes that go beyond ISO/IEC 17025:2017. It was reiterated that the CIPM should have a clear procedure to involve the RMOs and NMIs in discussions involving topics such as ILAC P10 and that an update of the relationship with ILAC should be on the agenda of the annual meeting of RMO chairs and the bureau. The RMO chairs will thus be able to feed information back to the NMIs.

It was asked if the latest draft of ILAC P10 includes revisions to address the two concerns that are highlighted above. Mr Henson confirmed that this is the case and that both points have been taken on board by ILAC. He added that more information on the background to the proposed changes to ILAC P10 and the other documents, as well as interactions with ILAC, is given in a briefing note on the CIPM webpage.

21. FEEDBACK FROM THE LABORATORY VISITS AND CBKT REPORT

The CIPM members visited the BIPM laboratories at 11 am on 21 March. The CIPM was divided into four groups, with each group visiting one laboratory for one hour. This was followed by a presentation on the CBKT programme by the Director of the ILC Department, the text of which is available on the CIPM webpage. The visits gave the CIPM and the bureau an opportunity to interact directly with the departments and the department directors. There was a brief discussion before the visits took place in order for the CIPM to consider a common message and to ensure that the visits were carried out as efficiently as possible. There was an opportunity for the CIPM to share feedback after the laboratory visits had taken place.

CBKT report

Mr Henson gave a brief summary of the Capacity Building and Knowledge Transfer (CBKT) programme to date, noting that there have been 16 CBKT projects, with 12 having been completed and four that are ongoing. A total of 308 people from 83 countries have benefited and 56 invited lecturers from 27 countries have provided support to deliver the projects. The beneficiaries have been from all RMOs, with more than 80 coming from AFRIMETS.

There have been directly measurable benefits from the CBKT programme. The ‘Leaders of tomorrow’ course, which was aimed at facilitating more efficient operation of the CIPM MRA, and which was held in November 2016 resulted in a 10 % measurable increase in CMC review performance in terms of adherence to review deadlines (from 80 % to 90 % between March 2016 and March 2018). The ‘Sound beginning in the CIPM MRA’ course, which was held in November 2017, was aimed at relevant staff from NMIs that had signed the CIPM MRA but had not yet submitted CMCs. The training was intended to help these NMIs achieve ‘right first time’ submissions into the CMC peer review system. Four Associate States that had joined after 2010 achieved ‘right first time’ CMC publication in the KCDB after attending the course, with a further Associate having CMCs at the final approval stage.

A number of CBKT laboratory programmes have been run and Mr Henson focused on the Metrology for Safe Food and Feed programme, which is being operated by the Chemistry Department in consultation with several NMIs. It addresses one of the most important export measurement problems for developing countries; the export of commodity foodstuffs affected by mycotoxin contamination. Detecting mycotoxins, determining their source and controlling contamination is difficult and the BIPM has been helping with the measurement aspects of putting remedial systems in place. The Metrology for Safe Food and Feed programme is ongoing and included the Africa food safety workshop, which was held in Pretoria, South Africa, on 4-8 June 2018.

Mr Henson explained what is meant by capacity building and knowledge transfer. The BIPM CBKT Programme refers to activities coordinated specifically by the BIPM to help the world-wide metrology community obtain, strengthen and maintain capabilities needed to fulfil their missions and objectives. The beneficiaries are those Member States and Associate States that have emerging metrology systems and more established NMIs that are expected to take on a broader role in running the world-wide system. He added that the BIPM also benefits from knowledge transfer from visiting scientists as well as their assistance in delivering the work programme.

The programme is divided into “core” CBKT initiatives and “topic-based” initiatives. The core CBKT initiatives cover areas that are of vital importance to Member States and the BIPM and have common interest to the global metrology community, such as supporting the CIPM MRA; this could be expanded in the future to cover areas such as entry into UTC. These initiatives will be funded, or partly funded, by the BIPM dotation in the next dotation period (2020-2023). Topic-based CBKT initiatives are flexible and can accommodate topics relating to metrology provided they align with the aims of the programme. Topic-based initiatives are reliant on external sponsorship. CBKT initiatives are delivered through workshop-based activities either at the BIPM or in the regions jointly with the RMOs; through laboratory-based capacity building placements at the BIPM or with partner NMIs and DIs; or via knowledge transfer by visiting scientists from the NMIs and DIs at the BIPM. The structure of the laboratory-based and workshop-based activities was explained.

Mr Henson described the six CBKT initiatives that are planned so far for 2019 to 2020, noting that additional ideas are under development and that suggestions for other initiatives and offers of sponsorship would be welcome. In addition, there are four ongoing initiatives, with Metrology for safe food and feed and Metrology for clean air being open for further sponsorship in 2020 and beyond.

A community of coordinators is being developed with the RMOs for CBKT activities through the JCRB and the meeting of RMO chairs. Each RMO has designated a contact person to facilitate more integrated delivery of CBKT initiatives with the RMOs. This has had the benefit of stimulating cross-RMO initiatives, such as placements on courses being offered to attendees from other RMOs as well as building greater understanding amongst the RMOs.

Mr Henson concluded by saying that the BIPM Work Programme for 2020-2023 includes 'core' CBKT initiatives for supporting the CIPM MRA. CBKT initiatives will become more integrated from 2020 onwards. He recalled that the CBKT programme was initially suggested to the 25th meeting of the CGPM (2014) as a funded project. Although no funding was forthcoming at that time, the CBKT initiative was launched as a sponsor-based programme in 2016. Since 2016, a considerable amount has been achieved.

Feedback from the laboratory visits

Prof. Ullrich reported back on behalf of the group that visited the Chemistry Department. The department is very active and has been successful with CBKT initiatives, with visitors being split 50:50 between CBKT participants and visiting scientists. The Chemistry Department's CBKT activities are well aligned with the needs of the NMIs, under the guidance of the CCQM. An area that could possibly be improved is the alignment of the department's activities with the needs of international organizations, which could be contacted to determine their exact requirements. Performance indicators were well presented and Prof. Ullrich commented that an annual presentation of KPIs would be useful to track their development, along with information about the internal funds that are used for project delivery. He noted that the department has been very successful in attracting external funds; however, it was not clear if there are additional demands from the NMIs and suggested that this could be the subject of a survey. Prof. Ullrich said that the visit had been very useful and that choosing to visit different departments in the future would have to be balanced against the benefit of visiting the same department to monitor progress. He concluded by saying that the department is asked to deliver a yearly report in September, which does not fit into the schedule of annual reporting. Dr Wielgosz, Director of the Chemistry Department, added that practice of reporting for the period to September is undertaken outside of the cycle of annual reporting. Moving to end-of-year reporting would save time.

Dr Usuda provided feedback on the group visit to the Physical Metrology Department. He said that there are many ongoing comparisons in the department, including onsite comparisons with the travelling quantum Hall standard. The comparisons cover a variety of development levels from mature subjects to top-level NMIs. The department has retained the capacity to manufacture Pt/Ir prototypes, which are still required by the Member States. Mass realization is well maintained and the first key comparison to determine the consensus value of the kilogram is planned. The Kibble balance and the voltage standards were presented to the visiting group. It was noted that work is ongoing to continue to reduce the uncertainty of the Kibble balance. Dr Usuda said that the visit was followed by a discussion with the Director and staff of the department. He said that the visit had been very useful and he agreed with Prof. Ullrich that future visits to different departments would have to be balanced against the benefit of visiting the same department to monitor progress. He added that care needs to be taken when discussing KPIs, as they vary considerably between departments. Dr Usuda concluded by saying that the Physical Metrology Department clearly follows the programme outlined at the CGPM and he suggested that a staff meeting should be organized to allow the CIPM to show its appreciation to the BIPM staff for the work that they undertake. Dr Stock, the Director of the Physical Metrology Department, commented that the visit had been appreciated by the staff of the department.

Dr Dimarcq gave a report on the group visit to the Time Department. He thanked the department and said that the visit had been very interesting; the group had received a clear presentation by Dr Tavella and the senior

staff of the department. The central role of the BIPM in the calculation of UTC had been explained, along with the importance of the role of coordination of the different time and frequency techniques at the world level and the promotion of the use of UTC as a single unique reference time. A presentation of the Time Department's work programme was presented to the group, particularly the evolution of the use of optical clocks in the construction of an atomic time scale and the development and exploitation of new time and frequency comparison techniques, especially the capability to precisely compare clocks using fibre optic techniques. Dr Dimarcq said that this work includes important interactions and relationships with other international organizations such as the International Earth Rotation and Reference Systems Service (IERS) and the International Telecommunication Union (ITU). He stressed that these interactions and relationships are also of vital importance to future questions regarding leap seconds. The visit was appreciated by the group and Dr Dimarcq commented that it is important to maintain the visits in the future, as well as allowing the groups to visit other departments. Dr Olthoff added that he had been very impressed by the department, particularly the broad range of technical, political and international aspects of time that have to be dealt with by a small team. Dr Tavella, Director of the Time Department, commented that in the future it may be useful if the departments could make their presentations to the CIPM before the visits, to give the members of the CIPM more time to prepare questions.

Dr Sené reported on the group visit to the Ionizing Radiation Department. He thanked Dr Judge, Dr Burns and Dr Coulon for taking the time to give the group a briefing and tour of the department. The briefing had been very clear on the value, need and impact of the department's work. The distinctiveness of the work being carried out in the department had been emphasized to the group, particularly how the work is carried out over a long timescale to provide a reference baseline for the NMI community. He noted that there is a clear focus to the work that balances three criteria: the primary role of meeting a need for instrumentation and facilities that provide a baseline over a long timescale and ensuring that the instrumentation and facilities are available on demand for NMIs for verifications and comparisons; a need to refresh and update equipment without compromising the decadal stability; and responding to the emerging needs of end users, with many new applications, in areas such as medicine, diagnostics and therapeutics. Dr Sené said that the work is backed up with a strategic plan. He commented that the Ionizing Radiation Department has a small number of staff to carry out a considerable work programme. The department carries out its interactions through NMIs that bring equipment to the BIPM and through visiting laboratories and secondments. Dr Sené said that there had been a discussion between the group and the department, bearing in mind the small number of staff, as to whether there would be any benefit to having longer secondments, rather than just receiving short-term visiting scientists. He concluded by saying that in the future it would be useful to receive a one-page presentation of background performance statistics in advance of the visits. The briefing had been very useful and it had been a good opportunity to meet the staff of the department; it had also provided an opportunity to gain an understanding of the developing relationships with other international organizations, particularly the IAEA. Dr Judge, the Director of the Ionizing Radiation Department, thanked the group for their visit and said that it had been appreciated by his colleagues in the department.

The President thanked all of those involved in the visits and said that time will be set aside in future CIPM meetings to ensure that all the members can visit all of the laboratories. He added that if any important issues arise from the visits, these should be fed back to the CIPM. The Director thanked everyone that participated in the visits and particularly for their enthusiasm. He commented that the visits had been devised as a way of refreshing the former presentations made to the CIPM by the department directors. The feedback from the latest visits will be noted.

The President noted the suggestion from Dr Usuda that a meeting between the CIPM and the BIPM staff should be organized.

22. PREPARATIONS FOR THE ESTABLISHMENT OF A WORKING GROUP OF MEMBER STATE REPRESENTATIVES

The President made some opening remarks on the issues resulting from the submission of a draft Resolution X “on the name of the intergovernmental organization created by the Metre Convention” to the 26th meeting of the CGPM (2018) by the Russian Federation. Following discussions at the General Conference, Draft Resolution X was withdrawn and instead it was proposed that a Working Group on governance and related issues be organized by the CIPM to report to the 27th meeting of the CGPM. In addition, and following the withdrawal of Draft Resolution X, Resolution 3 “On the objectives of the BIPM” was adopted by the 26th meeting of the CGPM. He commented that following on from this proposal, the CIPM President had written to Member State representatives on 15 January 2019 to seek their comments on the suggestion to establish a working group on governance and related issues. Feedback had been received on the issues raised.

The President said that the CIPM should formulate a clear proposal on how it will proceed and to communicate this to the Member States as soon as possible after the current meeting. Some of the Member States had an expectation that the CIPM would formulate terms of reference for the working group, although he said that at this stage this may be difficult. He suggested that the CIPM should focus on the exact nature of the issue that it is being asked to address, as this was not obvious from the feedback and therefore it had not been clear to the Member States how to respond to the proposals in Draft Resolution X. He suggested that the CIPM should focus on determining what the issues were that had led to the Russian Federation submitting Draft Resolution X to the 26th meeting of the CGPM, what had been the exact decision with regard to this issue during the General Conference and what is the exact task that the CIPM is expected to undertake. The President asked Dr Bulygin for his perspective on the background to the submission of Draft Resolution X.

Dr Bulygin said that the problem had originated from the questions over terminology that had been raised originally by Dr Quinn. He said that although a number of decisions on this issue had been taken by the CIPM over the years, there were some misunderstandings that remained, particularly that Member State representatives can declare that they are ‘members of the Metre Convention’. Dr Bulygin recalled that the term BIPM can have two meanings: the permanent scientific institute and the intergovernmental organization created by the Metre Convention. He said that some Member State representatives want to clarify this situation and recalled that this had been discussed at the informal meeting held on 12 November 2018, immediately before the 26th meeting of the CGPM. Draft Resolution X did not directly state that a working group should be set up, although this had been discussed at the informal meeting. Dr Bulygin suggested that the working group should not be organized by the Member State representatives, but should be organized by the CIPM.

The President thanked Dr Bulygin and returned to the issue of where the issue over terminology had originated. He recalled that the issue of whether “the BIPM” refers to either the laboratories or the wider organization had been discussed by the CIPM over many years. He asked the new members of the CIPM if they needed more background on the issue. It was asked if the perceived misunderstanding has any practical implications and, if not, is there really a problem. In addition, are there any concrete examples of where the misunderstanding has had a real impact. Dr Bulygin replied that there can be a misunderstanding if you ask Member State representatives to explain what organization they consider that they are members of. The President said that this is the fundamental issue; does the term BIPM refer to the site at Sèvres or the whole organization. Prof. Ullrich recalled that there is confusion arising from the report of the 96th meeting of the CIPM (2007), which stated that “The BIPM is an intergovernmental organization, which comprises only two organs: the CGPM and the CIPM.” and “After consideration by the CIPM and final decision by the bureau of the CIPM, these terminologies should be used in all official documents.” The President suggested that there

should not be a discussion on the details of the correct terminology at that point.

Dr Steele said that there had been information in documents that had been shared with the CIPM in advance of the meeting that focused on the governance challenges that this perceived confusion had led to, as referenced by the Russian Federation. He suggested that the issue was more about whether the organ created by the Metre Convention was also the collective voice of the organization and how this is interpreted and planned for in the future. This issue had been wrapped up in misunderstandings about whether or not Member States were signatories to a treaty or members of an organization; it is not possible to be a member of a treaty or a signatory to an organization. He was of the opinion that what needs to be reviewed was to clarify how these issues fit together, rather than opening up a review of the Metre Convention or by creating a new name for the organization. This opinion had been backed up by discussions at the informal meeting on 12 November 2018 and through his private discussions during the General Conference. He agreed with the earlier assertion that it is difficult to find concrete examples of actual problems caused by this confusion. Dr Steele said that from the information provided by the Member States in their letters to the CIPM it was clear that there had been concerns from the floor of the General Conference and that the preparatory work in advance of the 26th meeting of the CGPM had not been sufficient to allow any meaningful vote. Instead, the suggestion was that the issues should be investigated, defined, terms of reference created and a decision taken as to whether there is an actual problem. The findings could then be discussed at the 27th meeting of the CGPM. He added that although there is a necessity to start work on this issue as soon as possible, the Member States had not been willing to start work as quickly as proposed in the letter from the CIPM President dated 15 January 2019, with its implied terms of reference. The Member States had also been reluctant to propose members for the working group until the problem has been defined. Dr Steele suggested that a roadmap should be developed to define how the CIPM could progress towards having a report ready for discussion at the 27th meeting of the CGPM. He further suggested that the annual meetings of the CIPM, NMI Directors and Member State representatives would be useful fora for the necessary engagement. He recalled that some draft terms of reference had been developed by Canada, Germany, the Russian Federation and the USA. The role of the CIPM should be to create broad terms of reference that are specific enough to avoid opening up discussions on the Metre Convention or creating a new organization. He suggested that a drafting group could be set up to develop the roadmap, which would include the establishment of the working group. The working group could be launched at the meeting of Member State representatives in October 2019, with a full mandate and draft terms of reference proposed by the CIPM and reviewed by the Member State representatives that had responded to the letter from the CIPM President. The aim should be to have the findings from the working group ready for discussion at the meeting of Member State representatives in 2021, which would allow them to have a full year to discuss the findings in advance of the 27th meeting of the CGPM.

The President thanked Dr Steele and said that his was a good summary of the current situation. Dr Richard said that there remained some confusion as to whether there were three separate issues (the name of the organization, the number of organs of the organization and the governance of the BIPM) or whether these constituted one single issue.

The President summarized the discussions by saying that the origin of the issue had been concerned with the name of the organization and that this had opened into a wider discussion on governance of the BIPM. A way forward is needed to ensure that a firm solution from all the stakeholders is ready for the 27th meeting of the CGPM (2022). He proposed that a task group should be appointed by the CIPM that can carry out various tasks in advance of the next meeting of the Member State representatives in October 2019. He recalled that although it was difficult to determine exactly what the decision of the CGPM had been, it was clear that the CGPM had tasked the CIPM to establish a Working Group, which must include Member State representatives. The CIPM should start by setting up a task group, consisting of CIPM members, to discuss the issues and conclude exactly what the tasks of the working group should be and to develop terms of reference that should

be agreed by the CIPM before circulation. If there are any other issues that the task group uncovers, these should be reported back to the CIPM or the working group. He noted that it may be possible for certain governance issues to be dealt with by the CIPM. The President added that the task group should be set up as a first instance and that it should start its work as soon as possible, with the hope that it should be able to suggest a way forward within two months. The Task Group will need to establish a timetable to complete its work in time for the meeting of Member State representatives to be held in October 2019. The President called for volunteers for members of the Task Group. It was agreed that Dr Louw would be the convenor, with assistance from Dr Richard and Dr Steele. Dr Bulygin, Dr Castelazo, Dr Dimarcq, Dr Laiz, Dr Liew, Prof. Ullrich and the Director of the BIPM were appointed as members.

Since the three issues mentioned earlier concerning the name of the organization, the number of organs of the organization and the governance of the BIPM all have legal implications, it was suggested that the BIPM Legal Adviser, Mr Rojas Ceballos should be mandated to put together a package of appropriate background information, in a concise format, for the Task Group as soon as possible. Prof. Ullrich commented that in the very beginning of the process he had contacted his Foreign Office unofficially and will share their opinion as unofficial external input

Decision CIPM/108-19 In response to discussions held before the adoption of Resolution 3 “On the objectives of the BIPM” at the 26th meeting of the CGPM, the CIPM established a CIPM Task Group to propose terms of reference for a Working Group of Member State representatives. It appointed Dr W. Louw as its convener, assisted by Drs P. Richard and A. Steele. Drs F. Bulygin, I. Castelazo, N. Dimarcq, H. Laiz, T. Liew, Prof. J. Ullrich and the Director of the BIPM were appointed as the members.

It charged the Director of the BIPM to provide the Task Group with appropriate background information, in a concise format, as soon as possible.

It requested the Task Group:

- to identify the main issue(s),
- to determine if any of those issue(s) can be addressed by the CIPM,
- to propose terms of reference for a Working Group of Member State representatives - for agreement by the CIPM prior to circulation, and
- to establish a timeline consistent with the meeting of Member State representatives to be held in October 2019.

23. DATES FOR FUTURE MEETINGS OF THE CIPM**2019**

Week 42 108th meeting of the CIPM (Session II)

2020

Week 25 109th meeting of the CIPM (Session I) - provisional

Week 42 109th meeting of the CIPM (Session II)⁷

24. OTHER MEETINGS AND PROPOSALS FOR FUTURE WORKSHOPS

The Varenna Summer School 2019 will be held in Varenna (Italy) on 4-12 July 2019. The Summer School is organized jointly by the BIPM and the Italian Physical Society. The School has a modular structure, with a three-day Core Module on the “Fundamental Metrology” and a choice of two three-day optional modules covering: “Physical metrology” and “Quality of life”. Full details are available on the BIPM website.

The BIPM Workshop on Advanced Time and Frequency Transfer (ATFT): the ultimate frontier for remote comparison methods will be held the BIPM on 10 October 2019.

Dr Rietveld commented that the CIPM *ad hoc* Working Group on the Reproducibility of Research Data and Related Topics will meet at the BIPM on 22 March 2019 and that this is an area that could be the subject of a future workshop.

25. ANY OTHER BUSINESS

The President initiated a discussion on honorary membership of the CIPM. It was suggested that the criteria for election of honorary members should be reviewed by the bureau on 22 March 2019. The criteria will then be circulated to the CIPM members and a call for nominations will be made ready for the next session in October 2019.

The Director said that members of the CIPM had told him that they have received communications from a representative of Kosovo, including an official communication received by the BIPM. The BIPM has been in contact with the French Ministry for Europe and Foreign Affairs regarding this issue. He commented that if there are any questions on this issue, they can be addressed informally to the Director, Mr Henson or Mr Rojas Ceballos. He asked the CIPM not to reply to the emails as it is not within the power of the CIPM to take decisions on whether an economy is recognized as a state within the context of the BIPM.

Mrs Fellag Ariouet gave a presentation on the partnership between the BIPM and the LNE in support of the competition “*Français et Sciences*” (French Language and Sciences), which promoted the revision of the SI to a wider public in 2018 by focusing on the theme “Weights and Measures”. The competition was launched on World Metrology Day (20 May 2018) and ended a few days before the 26th meeting of the CGPM (2018). The competition was open to teachers in France and abroad, cultural centres, *Instituts français* and *Alliances françaises*, libraries, museums and French language teaching centres. A total of 108 entries were received from

⁷ If Session I is not required, the 109th meeting of the CIPM will be held in one session in week 42 of 2020.

39 countries (18 Member States and six Associates). The competition was promoted by the *Organisation internationale de la Francophonie* and in France by the *Ministère de la Culture*. The top eight prize winners were from France and Algeria (joint first prize), Japan, Canada, Belgium, Romania, Cameroon and Switzerland. The theme for the competition for 2019 is “the moon”. Dr Jean-Philippe Uzan, one of the keynote speakers at the 26th meeting of the CGPM, is associated with the 2019 competition. Mrs Fellag Ariouet asked if any of the CIPM members would be able to welcome the winning students at their NMIs for a presentation and tour.

Mr Henson recalled that the KCDB 2.0 will be launched in 2019 and at the same time the entire suite of CIPM MRA guidance documents will be updated so that they are consistent with the operation of the new systems and recognizing that over time a number of documents have been written and added, some of which can be merged and compressed into others. He noted that there are no fundamental changes to the documents although this rationalization will require a significant amount of work. Mr Henson said that the JCRB has agreed that the changes can be made by the JCRB and he asked the CIPM for confirmation that they agree to the work proceeding. It was noted that this had been discussed at the previous CIPM meeting and that there is a CIPM liaison representative to the JCRB, so there is good oversight of the issue.

Decision CIPM/108-20 The CIPM welcomed the progress on the rationalization of the suite of CIPM MRA guidance documents and accepted the proposal from the JCRB that the JCRB should oversee their completion and implementation.

Dr Bulygin commented that Decision CIPM/107-24 “*The CIPM thanked the Chair of the Sub-Committee for Awards for his report and asked him to take account of the comments made by the CIPM and refine the proposals of the Sub Committee for the next meeting of the CIPM*” had not been addressed. Dr Bulygin asked if this action should be resumed. The President noted this comment and suggested that it should be on the agenda for the next session in October 2019. Dr Rietveld asked the CIPM Sub-Committee on Awards to consider the proposal he had sent to them by email.

Dr Bulygin said that the CIPM should note that it expresses its gratitude to the previous members of the CIPM bureau and to the recently retired members of the CIPM.

Dr Castelazo asked if a CIPM decision is needed on the new *mise en pratique* for the metre. It was agreed that a decision was not needed, but it was noted that the CIPM welcomed the new *mise en pratique* for the metre.

The President closed the meeting.

Appendix 1

REPORT OF THE SECRETARY AND ACTIVITIES OF THE BUREAU OF THE CIPM

(June 2018 – March 2019)

The CIPM bureau elected in 2015 held its last meeting at the BIPM on the morning of 18 March 2019. The material provided prior to the meeting included the usual information on administrative and financial matters. Discussions at this meeting focused on preparation for the BIPM-ILAC, BIPM-OIML and the BIPM-ILAC-OIML-ISO meetings on the following days, as well as the first meeting of the newly-elected CIPM later in the week. On the afternoon of 19 March, the Secretary attended the annual Management Review meetings for the BIPM Quality System and the BIPM Health and Safety System. The President and one of the Vice-Presidents attended the BIPM-ILAC bilateral meeting.

Preparations for Election of a new CIPM Bureau

The bureau reviewed the process to be followed for the election of the new bureau, adding some additional details to the published procedure.

CIPM Consultative Committees, Sub-Committees and *ad hoc* Working Groups

The bureau noted the need to quickly appoint new CCQM and CCTF Presidents to fill vacancies created by the retirement of Willie May and Luc Énard. Candidates for these positions were advised to prepare a brief statement for presentation at the CIPM meeting later in the week. The bureau briefly reviewed the current membership of CIPM Sub-Committees, taking note of the need for the newly elected Committee to assign new members to many of these. Particularly important is the requirement for a new Chair of the Pension Fund Advisory Board. A new Chair for the *ad hoc* Working Group on Conditions of Employment will also be needed.

Other appointments noted by the bureau that need to be decided by the CIPM were a CIPM representative to the JCRB, and representatives to the JCTLM and the JCGM.

Meetings with ILAC, OIML and ISO

The annual meetings with ILAC, OIML and ISO were held on the afternoon of 18 March and on 20 March. As usual, they were scheduled within the same week as the March bureau meeting. For the past several years, most or all of the CIPM bureau members have attended these meetings, as has the BIPM Director and the International Liaison and Communication Department Director. The bureau recommends that the new CIPM consider whether it might be more appropriate for the CIPM to be represented by two or three members, one of who is a bureau member, rather than by the entire bureau.

The text of a CIPM-ILAC joint communication regarding accreditation of NMI calibration and measurement services, originally agreed in 2012, has been updated with some minor revisions and is now ready for CIPM approval. A joint statement on improving world-wide traceability and acceptance of measurements carried out within the CIPM MRA and the ILAC arrangement needs a major revision.

The bureau noted the need for a CIPM response to a proposal made by the CIML President (Roman Schwartz) at the 26th meeting of the CGPM (2018) to create a joint BIPM-OIML task group to explore opportunities for increased collaboration. At the subsequent BIPM-OIML bilateral meeting, it was agreed that the objectives of such a joint task group need to be more clearly defined before proceeding.

BIPM-IUPAC Memorandum of Understanding

At the invitation of IUPAC, the BIPM has developed a draft MoU that needs to be reviewed by the CIPM before sending it to IUPAC for comment.

Action Arising from Resolution 5 of the 26th meeting of the CGPM (2018) “On the financial arrears of Member States and the process of exclusion”

Resolution 5 of the 26th meeting of the CGPM (2018) instructs the CIPM to “address the situation where historical practice has resulted in the accumulation of arrears”. The bureau recommends the establishment of an *ad hoc* working group to work with the BIPM International Liaison and Communication Department to carry out this instruction.