

**Bureau international des poids et mesures**

# **Comité international des poids et mesures**

103rd meeting (March and November 2014)

## **Report of the 103rd Meeting of the International Committee for Weights and Measures 2014**

This Report of the 103rd meeting of the International Committee for Weights and Measures (March and November 2014) is one of a set of three documents issued annually by the CIPM and the BIPM which collectively cover the formal reporting to Member States, the other two reports in the set being the:

- Director's Report on the Activity and Management of the BIPM 2014, and the
- *Rapport annuel aux gouvernements des hautes parties contractantes sur la situation administrative et financière du Bureau international des poids et mesures 2014.*

### **Note on the use of the English text**

To make its work more widely accessible the International Committee for Weights and Measures publishes an English version of its reports.

Readers should note that the official record is always that of the French text. This must be used when an authoritative reference is required or when there is doubt about the interpretation of the text.

## TABLE OF CONTENTS

Member States and Associates of the General Conference	<b>105</b>
--	------------

### **Proceedings of session I, 12-13 March 2014 107**

Executive summary	<b>108</b>
Members of the CIPM as of 12 March 2014	<b>109</b>
Agenda	<b>111</b>
1. Opening of the meeting, quorum, agenda	<b>112</b>
2. <i>In camera</i> session	<b>112</b>
3. Confirmation of the minutes of the sessions held in 2013 and list of actions	<b>112</b>
4. Report of the Secretary and activities of the bureau of the CIPM	<b>113</b>
5. Update on the activities of the BIPM by the Director	<b>114</b>
5.1. Introduction	<b>114</b>
5.2. Membership and Associates	<b>114</b>
5.3. Finance	<b>114</b>
5.4. Human Resources	<b>115</b>
5.5. Development of the Work Programme for 2016-2019	<b>116</b>
5.6. Communications and Publications	<b>116</b>
5.7. CGPM	<b>117</b>
5.8. Operations	<b>118</b>
5.9. Other matters	<b>118</b>
6. Report from the Chair of the CIPM Standing Sub-Committee on Finance	<b>120</b>
7. Financial and administrative matters	<b>120</b>
8. Report from the Chair of the CIPM <i>ad hoc</i> Working Group on CIPM Membership	<b>121</b>
9. Process of communication, consultation and exchange of information and opinions with the NMI Directors and Member State Representatives in preparation for the 25th CGPM meeting	<b>123</b>
10. Development of the BIPM Work Programme (2016-2019) and strategy	<b>123</b>
11. CIPM MRA review process	<b>125</b>
12. Plans for the 25th CGPM meeting	<b>125</b>

13. Possible resolutions to be submitted to the CGPM **126**
  - 13.1. Revision of the International System of Units, the SI **126**
  - 13.2. On the election of the CIPM **126**
  - 13.3. On the Pension and Provident Fund of the BIPM **127**
  - 13.4. Dotation of the BIPM for the years 2016 to 2019 **127**
  - 13.5. On the importance of the CIPM MRA **127**
  - 13.6. Other Draft Resolutions **127**
14. Report from the Chair of the CIPM Standing Sub-Committee on the BIPM Pension and Provident Fund and Health Insurance **128**
15. Report from the Chair of the CIPM *ad hoc* Working Group on BIPM Conditions of Employment **128**
16. The role and performance of the CIPM as a scientific body and a direction-giving and supervisory body of the BIPM **128**
17. Proposed amendments to the SI Brochure **129**
18. Other BIPM issues **130**
  - 18.1. BIPM Policy on Support from Third Parties **130**
  - 18.2. Donation of a NMR device to the BIPM **130**
  - 18.3. Funding for the JCTLM **130**
  - 18.4. New BIPM website and designs **131**
  - 18.5. Policy on Guest Laboratory Participation (BIPM letter of acceptance and agreement) **131**
  - 18.6. BIPM building works and IT facilities **132**
19. International cooperation **132**
20. Meetings and workshops **133**
  - 20.1. Future BIPM workshops **133**
21. Any other business **133**
  - 21.1. Terminology **133**
  - 21.2. Outcome of the Royal Society meeting on *G* **134**
22. Date of next meeting **134**
23. Closure of the meeting **134**

**Appendix 1:** Report of the Secretary and activities of the bureau of the CIPM (October 2013 to March 2014) **135**

**Appendix 2:** CIPM President's letter in response to Norwegian concerns on the 'Criteria and process for election of CIPM members' document **139**

**Proceedings of session II, 13-14 November 2014 141**Executive Summary **142**Members of the CIPM as of 13 November 2014 **143**Agenda **145**

1. Opening of the session, quorum, agenda **147**
2. Confirmation of the minutes of Session I and list of decisions **147**
3. Report of the Secretary and activities of the bureau of the CIPM **149**
4. Update on the activities of the BIPM by the Director **149**
5. Financial matters **151**
6. Results of the extraordinary campaign of measurements with the IPK **152**
7. Report from the President of the CCM **154**
8. Report from the BIPM Mass Department **154**
9. Report from the President of the CCU **155**
10. Update on plans for the 25th CGPM meeting **156**
11. The long-term strategy of the BIPM **156**
12. Review of proposals for the BIPM Work Programme and a BIPM Visitor Programme **157**
13. Report from the Chair of the CIPM Sub-Committee on the BIPM Pension and Provident Fund and Health Insurance **157**
14. Report from the Chair of the CIPM *ad hoc* Working Group on BIPM Conditions of Employment **158**
15. Review of proposed scenarios for the BIPM dotation 2016-2019 **158**
16. Review of the actions carried out to prepare for the CIPM election **159**
17. The proposal for a CGPM ‘Committee for CIPM Election’ **159**
18. Succession planning for CIPM leadership **159**
19. Review of the major points likely to arise in discussion of CGPM Resolutions **160**
20. Convocation for the 26th CGPM meeting **161**
21. Report from the BIPM Electricity Department and the CCPR **162**
22. Report from the BIPM Chemistry Department, the CCQM and the JCTLM **163**
23. Report from the BIPM Ionizing Radiation Department, the CCRI, the CCAUV and the CCT **165**
24. Report from the BIPM Time Department, the CCTF and the CCL **167**
25. Proposed changes to CC Members and Observers **169**

26. Presentation by the delegation from the Islamic Republic of Iran **169**
27. Review of the issues raised by the delegation from the Islamic Republic of Iran (in camera) **170**
28. Report on Coordination and Liaison **171**
29. Report from the JCRB including steps towards the review of the CIPM MRA **172**
30. CIPM position on revisions of ISO/IEC 17025 and ISO Guide 34 **173**
31. Report from the JCGM **173**
32. Future BIPM workshops and meetings **174**
33. Proposed revisions to the BIPM Rules and Regulations (RRI) **175**
34. The big *G* consortium **175**
35. Any other business **176**
36. Closure of the meeting **176**

**Appendix 1:** Report of the Secretary and activities of the bureau of the CIPM (March 2014 to November 2014) **177**

Acronyms used in the present volume **184**





## MEMBER STATES OF THE BIPM AND ASSOCIATE STATES AND ECONOMIES OF THE GENERAL CONFERENCE

as of 14 November 2014

### Member States (56)

Argentina	India	Russian Federation
Australia	Indonesia	Saudi Arabia
Austria	Iran (Islamic Republic of)	Serbia
Belgium	Iraq	Singapore
Brazil	Ireland	Slovakia
Bulgaria	Israel	South Africa
Canada	Italy	Spain
Chile	Japan	Sweden
China	Kazakhstan	Switzerland
Colombia	Kenya	Thailand
Croatia	Malaysia	Tunisia
Czech Republic	Mexico	Turkey
Denmark	Netherlands	United Kingdom of Great Britain and Northern Ireland
Dominican Republic	New Zealand	United States of America
Egypt	Norway	Uruguay
Finland	Pakistan	Venezuela (Bolivarian Republic of)
France	Poland	
Germany	Portugal	
Greece	Republic of Korea	
Hungary	Romania	

### Associates of the General Conference (41)

Albania	Georgia	Paraguay
Bangladesh	Ghana	Peru
Belarus	Hong Kong (China)	Philippines
Bolivia (Plurinational State of)	Jamaica	Republic of Moldova
Bosnia and Herzegovina	Latvia	Seychelles
Botswana	Lithuania	Slovenia
CARICOM <sup>1</sup>	Luxembourg	Sri Lanka
Chinese Taipei	Malta	Sudan
Costa Rica	Mauritius	Syrian Arab Republic
Cuba	Mongolia	Ukraine
Ecuador	Montenegro	Viet Nam
Estonia	Namibia	Yemen
Former Yugoslav Republic of Macedonia	Oman	Zambia
	Panama	Zimbabwe

---

<sup>1</sup>The Caribbean Community (CARICOM) is an Associate on behalf of eleven of its Member States: Antigua and Barbuda, Barbados, Belize, Dominica, Grenada, Guyana, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, and Trinidad and Tobago.



**International Committee  
for Weights and Measures**

**Proceedings of Session I**

**of the 103rd meeting**

**(12-13 March 2014)**

## **Executive Summary**

### **Session I of the 103rd meeting of the CIPM (12-13 March 2014)**

#### **New CIPM election procedure**

The CIPM unanimously supported the text of a ‘collective resignation letter’ that is required to initiate the new election process and the CIPM Secretary will re-contact Member State Representatives and NMI Directors to encourage submission of further candidates for CIPM membership.

#### **BIPM Work Programme 2016-2019**

The CIPM supported the proposed BIPM Work Programme 2016-2019.

#### **CIPM MRA review**

The CIPM charged the BIPM to hold a meeting of NMI Directors in 2015 dedicated to the CIPM MRA review.

#### **Plans for the 25th CGPM meeting**

The plans and timetable for the 25th CGPM meeting (18-20 November 2014), to be held in Versailles, were presented.

#### **Resolutions for the CGPM meeting**

The CIPM accepted five draft resolutions for submission to the CGPM.

#### **Amendments to the SI Brochure**

The CIPM approved changes within the framework of updating the 8th edition of the SI brochure and will invite the CCs to comment on draft chapters one, two and three of the 9th edition.

#### **JCTLM**

The CIPM supported the ongoing role of the BIPM as the JCTLM Secretariat and encouraged the BIPM to seek one-off funding to support streamlining the processes and evolution of the JCTLM database.

## MEMBERS OF THE INTERNATIONAL COMMITTEE FOR WEIGHTS AND MEASURES

As of 12 March 2014

### President

B. Inglis, National Measurement Institute (NMIA), Lindfield, Australia.

### Secretary

R. Kaarls, Zoeterwoude, the Netherlands.

### Members

B.R. Bowsher, National Physical Laboratory (NPL), Teddington, United Kingdom.

H.S. Brandi, *Instituto Nacional de Metrologia, Qualidade e Tecnologia* (INMETRO), Rio de Janeiro, Brazil.

K. Carneiro, Holte, Denmark.

Y. Duan, National Institute of Metrology (NIM), Beijing, China.

L. Énard, *Laboratoire National de Métrologie et d'Essais* (LNE), Paris, France.

D.-I. Kang, Korea Research Institute of Standards and Science (KRISS), Daejeon, Republic of Korea.

V.N. Krutikov, *Rosstandart*, Moscow, Russian Federation.

W. Louw, National Metrology Institute of South Africa (NMISA), Pretoria, South Africa.

W.E. May, National Institute of Standards and Technology (NIST), Gaithersburg, United States of America. *CIPM Vice-President*.

J.W. McLaren, Ottawa, Canada. *CIPM Vice-President*.

H.O. Nava-Jaimes, *Centro Nacional de Metrología* (CENAM), Querétaro, Mexico.

A. Sacconi, *Istituto Nazionale di Ricerca Metrologica* (INRIM), Turin, Italy.

H. Uğur, Mugla, Turkey.

J. Ullrich, *Physikalisch-Technische Bundesanstalt* (PTB), Braunschweig, Germany.

T. Usuda, National Metrology Institute of Japan (NMIJ/AIST), Tsukuba, Japan.

J. Valdés, *Instituto Nacional de Tecnología Industrial* (INTI), Buenos Aires, Argentina.

**Honorary members**

E. Ambler, Hilton Head Island, United States of America.

W.R. Blevin, Glenhaven, Australia.

L.M. Branscomb, La Jolla, United States of America.

J.V. Dunworth, Ramsey, Isle of Man, United Kingdom.

E.O. Göbel, Braunschweig, Germany.

K. Iizuka, Tokyo, Japan.

D. Kind, Braunschweig, Germany.

J. Kovalevsky, Grasse, France.

J. Skákala, Bratislava, Slovakia.

## Agenda

1. Opening of the session, quorum and approval of the agenda.
2. *In Camera* session.
3. Confirmation of the minutes of the sessions held in 2013 and list of actions.
4. Report of the Secretary and activities of the Bureau of the CIPM, including an update on new and prospective Members and Associates.
5. Update on the activities of the BIPM by the Director.
6. Report from the Chair of the CIPM Standing Sub-Committee on Finance.
7. Financial and administrative matters.
8. Report from the Chair of the CIPM *ad hoc* Working Group on CIPM Membership.
9. Process of communication, consultation and exchange of information and opinions with the NMI Directors and Member State representatives in preparation for the 25th CGPM meeting.
10. Development of the BIPM Work Programme (2016-2019) and strategy.
11. CIPM MRA review process.
12. Plans for the 25th CGPM meeting (2014).
13. Possible resolutions to be submitted to the CGPM.
14. Report from the Chair of the CIPM Standing Sub-Committee on the BIPM Pension and Provident Fund and Health Insurance.
15. Report from the Chair of the CIPM *ad hoc* Working Group on BIPM Conditions of Employment.
16. The role and performance of the CIPM as a scientific body and a direction giving and supervisory body of the BIPM.
17. Proposed amendments to the SI Brochure.
18. Other BIPM issues.
19. International cooperation.
20. Meetings and workshops.
21. Any other business.
22. Date of next meeting.
23. Closure of the meeting.

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

The International Committee for Weights and Measures (CIPM) held Session I of its 103rd meeting on Wednesday 12 March and Thursday 13 March 2014 at the International Bureau of Weights and Measures (BIPM).

Present: B.R. Bowsher, H.S. Brandi, K. Carneiro, Y. Duan, L. Énard, B. Inglis, R. Kaarls, D.-I. Kang, W. Louw, W.E. May, J.W. McLaren, H.O. Nava-Jaimes, A. Sacconi, J. Ullrich, T. Usuda and J. Valdés.

Apologies were received from: V. Krutikov, H. Uğur and M.J.T. Milton.

Also attending the meeting were: C. Fellag Ariouet (Personal Assistant to the Director and head of the Secretariat and Housekeeping Office), A. Henson (Director of the International Liaison and Communication Department), C. Planche (Librarian/Drafting Officer), T.J. Quinn (Emeritus Director), R. Sitton (Publications Officer) and R. Wielgosz (Acting Operational Director).

The following were in attendance for parts of the meeting: I. Andernack (head of the BIPM Finance, Budget and Procurement Office), S. Arlen (head of the BIPM Legal, Administration and Human Resources Office) and M.J.T. Milton<sup>1</sup> (Director of the BIPM).

Dr Inglis, President of the CIPM, opened the session. With 16 out of 18 members present the quorum was satisfied according to Article 12 of the Regulations annexed to the Metre Convention.

Two agenda points were added at the request of Dr Quinn:

21.1 Terminology.

21.2 Outcome of the Royal Society meeting on *G*.

## 2. **IN CAMERA SESSION**

The *in camera* session was held on 13 March at 9.00 am. During this session, reports were given by Dr Kaarls on the work of the CIPM Standing Sub-Committee on the BIPM Pension and Provident Fund and Health Insurance and by Dr McLaren on the CIPM *ad hoc* Working Group on Conditions of Employment.

## 3. **CONFIRMATION OF THE MINUTES OF THE SESSIONS HELD IN 2013 AND LIST OF ACTIONS**

The minutes of Session II of the 102nd meeting (2013), as approved by correspondence, were accepted as a true record.

---

<sup>1</sup> By video link for part of the meeting



The President reviewed the decisions from Session I (2013). The status of three points were noted:

**Decision CIPM/102-31** *The CIPM requested the BIPM to draft a decision for approval at its next meeting that will bring the new procedure into effect as described in Step 5 of the document ‘Criteria and Process for Election of CIPM Members’ (To initiate this new Election Process, current CIPM Members have collectively agreed to vacate their Appointments congruent with the first meeting of the newly elected CIPM if not re-elected).*

The CIPM bureau discussed this decision on 11 March and had produced a first draft of a ‘collective resignation letter’. The final version was made available for signing on 13 March.

**Decision CIPM/102-39** *The CIPM approved, in principle, the proposal from the President of the Consultative Committee for Amount of Substance: Metrology in Chemistry (CCQM) to reorganize its structure and change its name to better address biology within its scope.*

This proposal is under way.

**Decision CIPM/102-44** *The CIPM noted the need to review the effectiveness and efficiency of the CIPM MRA with some urgency and decided to request the Consultative Committees and the Joint Committee of the Regional Metrology Organizations and the BIPM (JCRB) to initiate their individual reviews of its implementation and operation as soon as possible. Guidelines and a timescale for these reviews will initially be based on the work initiated by the CCQM and will be circulated within two months. A formal overarching review of the effectiveness and efficiency of the CIPM MRA, taking into account the outcomes of the CC and JCRB reviews, will be conducted by a committee with membership and terms of reference to be established by the CIPM. Membership to include representatives from the CIPM, the regions and others. It was noted that Robert Kaarls, Luc Énard and Wynand Louw offered to serve as members.*

The CIPM bureau proposed an alternative course of action later in the agenda (see §11).

**Decision CIPM/103-01** The CIPM accepted the minutes of the 102nd meeting of the CIPM as a true record.

#### 4. REPORT OF THE SECRETARY AND ACTIVITIES OF THE BUREAU OF THE CIPM, INCLUDING AN UPDATE ON NEW AND PROSPECTIVE MEMBERS AND ASSOCIATES

Dr Kaarls, Secretary of the CIPM, gave his report (see Appendix 1). He underlined the fact that the Republic of the Philippines (which became an Associate on 1 June 2002) has met the criteria to be encouraged to become a State Party to the Metre Convention. The CIPM decided to proceed with encouraging the Republic of the Philippines to become a Member State.

**Decision CIPM/103-02** The CIPM decided, on the basis of the criteria it has previously adopted, that it would be appropriate for the Republic of the Philippines to become a State Party to the Metre Convention. The BIPM will convey the Decision, recalling Resolution 4 ‘On the status of Associate State of the General Conference’ adopted by the CGPM at its 24th meeting, and the implications regarding the increase in subscriptions should the Republic of the Philippines choose to remain as an Associate of the CGPM.

## **5. UPDATE ON THE ACTIVITIES OF THE BIPM BY THE DIRECTOR**

Dr Milton, Director of the BIPM, gave the following report for the period October 2013 to March 2014 by video link, the verbatim text of which is given below.

### **5.1. Introduction**

“As you know, I have had to take time away from the BIPM for medical treatment. During the weeks running up to this I put a lot of thought into how to establish interim arrangements to operate the BIPM during the time I would be away. I discussed these with the President and the Secretary. My starting point was a re-analysis of how much of my time was spent on long-term and short-term issues and how much was involved with operational and strategic issues. As a result of that, I developed a detailed Job Description for an Acting Operational Director and appointed Robert Wielgosz to take that role during my absence. The tasks of the acting operational director are strictly operational. The other significant interim arrangement was that I asked Andy Henson to coordinate the development of the draft BIPM work programme in my absence.

Additionally, we have been supported by Bob Kaarls who has visited each month to chair the Management Meeting.

In practice, I have been fully active from here in Teddington over email, telephone and Skype for more than 50 % of the time.

### **5.2. Membership and Associates**

I would like to highlight some improvements to our processes in communicating with Member States and Associates. When the Notification of contributions and subscriptions was prepared in December 2013, it was published on the website as well as being sent in hard copy to the embassies. At the request of some Member States, we have, for the first time, produced a version in English and given clear instructions about requesting invoices – which are now required by several countries.

### **5.3. Finance**

The BIPM Accountant, Isabelle Andernack, will tell you about the work under way to prepare the accounts for 2013. We both met with the auditor from KPMG in December. We told him that the CIPM had decided to adopt the International Public Sector Accounting Standards (IPSAS) standards for financial instruments and explained our plans to do this. He presented his timetable for the audit.

Isabelle Andernack also hosted a visit from Brian Bowsher on 26 February which I was not able to join in with. I am sure that Isabelle and Brian will provide some information about this.

Isabelle Andernack and I have also held a meeting with our investment manager from HSBC in December. They have agreed to take a mandate to invest the assets of the pension fund and the BIPM. The contract for this is now the subject of legal review and is very close to being signed.

Finally, a lot of progress has been made with the analysis of the pension fund and its sustainability. Following the meeting last October, we invited all of the National Metrology Institute (NMI) Directors to propose additional “scenarios” for the pension fund that we should include in some further modelling.

We only received two responses, which I turned into detailed scenarios and sent to Mercer [an international actuarial company] for modelling. The results of the modelling were received two weeks ago, and after some review were submitted to the Sub-Committee on Pensions and Healthcare Insurance for its meeting on 7 March 2014. The meeting was very effective. A consensus is now developing about how we can get the Pension Fund into “Financial Equilibrium”.

#### 5.4. Human Resources

You will recall that the post of Finance and Administration Director was abolished on 1 December 2013. At that point I made substantial the temporary arrangements that had been operating successfully for the previous three months. I also agreed new job descriptions for a number of the staff involved.

You have seen the changes in the BIPM Regulations, Rules and Instructions (RRI) needed to reflect the new organization. I circulated them to you for voting on 13 February 2014. This is something that the meeting will have to return to later. Perhaps I should remind you that before submitting proposals for revisions to the RRI for voting by the CIPM I am compelled by the rules to discuss them with the BIPM Commission for Conditions of Employment (CCE). I cannot submit anything to you that has not been seen by the CCE. Hence the voting must be on the text as seen. If you don't agree with the text submitted, then please vote no and I will have to take it back to the CCE before you can vote on it again. I cannot progress on the basis of votes that are “qualified”. If the proposals are not approved, I will take them away and re-draft them. Then I typically give the CCE three weeks to make their comments. Then after allowing some time to respond back to the CCE, I will submit them back to you in about two months' time.

In order to help the six people who work in finance and human resources (HR) to work together, we are renovating the offices at level minus two in the Nouveau Pavillon for them to use. A consequence of this is that the scientists of the Mass Department have moved out of the Nouveau Pavillon. The designs for the new offices will be very modern, and I think the staff are looking forward to working there. Robert Wielgosz and Céline Fellag have done a great deal to progress this work; and Aldo Dupire and his staff in the workshop have done most of the building work.

Before I left for my medical treatment, I made it a priority to hold individual discussions with each Department Director about their performance and the performance of their staff during 2013. I also spoke to each of them about which staff might merit pay rises or bonuses for their performance in 2013. The task was finished before I left the site. Subsequently, I discussed some “special cases” with Department Directors on the telephone in January; these were all settled before the pay roll was run in January.

With the agreed increases in salary and the planned changes in staff I am projecting that the salary bill will increase by 2.8 % to the end of 2014.

A salary survey has been commissioned to support the work of the CIPM *ad hoc* Working Group on Conditions of Employment. This will be carried out for us by the International Service for Remunerations and Pensions (SIRP) who have performed this work for the BIPM previously. Sigrid Arlen and I have reviewed the entire set of job descriptions sent to SIRP, which was quite a big job.

Moving on to staff changes, I am pleased that Dr Pierre Gournay has been recruited as a physicist and will replace Dr Roland Goebel who is retiring from the Electricity Department. Sadly, Mr Alain Picard continues to be on long-term sick leave.

Additionally, vacancies have been advertised for: a Principal Physicist for Mass Metrology, an Assistant in Mass metrology and a 3-year post on the watt balance project.

Also in December, Sigrid Arlen and I received a presentation from our healthcare insurer, Vanbreda. They provided a very thorough analysis of the current state and trends in our healthcare costs. This was the first time that I had seen these data. Unfortunately, our costs have been higher than our contributions for five out of the last six years. This is clearly not sustainable. I shared the data with the *Commission Assurance-Maladie* (CAM), the staff commission that addresses healthcare issues and they agreed that it was an urgent matter to increase our contributions towards healthcare, which we have done by the maximum step-increase permitted under the rules. They are now 12.25 % of which the BIPM pays 7.5 % and the remainder is paid by staff.

## 5.5. Development of the Work Programme for 2016-2019

Along with the finances, my priority over the past two months has been the development of the draft Work Programme for 2016 to 2019. Andy Henson has done an excellent job of coordinating this whilst I have been away from the site. I have been in telephone contact with each of the Department Directors individually about it.

Perhaps, before we get into the detail of the document circulated to you, it is worth looking back to Resolution 10 passed at the last CGPM meeting “On the role, mission, objectives, long-term strategy and governance of the BIPM”. When we look at the recommendations of this group, I think we can be sure that the CIPM and BIPM have done what has been necessary to follow up on everything that was requested. But we might reflect on the fact that the motivation of the conference in setting up the *ad hoc* group seems to have been mainly to do with the long-term future of the BIPM. In putting together a draft work programme for 2016 to 2019, we are looking ahead, but only as far as 2019.

In order to bring together estimates for the dotation that can cover the work programme, we have to address some very long-term issues that affect our cost base: particularly the future of the pension fund, the provision of healthcare insurance for staff and even the staff terms and conditions. These are issues that we were specifically asked to analyse by the *ad hoc* group and also at the Directors’ meeting.

These issues have the potential to make an impact on very important matters like staff morale, staff recruitment and staff retention. These are all less tangible than the finance numbers, but are actually at least as important. Some of the decisions on the table are things that cannot easily be reversed.

I would also like to remind you that this CIPM meeting was brought forward by three months from its usual dates in June to these dates in March. This is useful because it enables you to comment on the draft work programme. But, a consequence of these early dates is that the full picture is not yet available with any accuracy.

## 5.6. Communications and Publications

Last year we made some very useful improvements in the presentation and timeliness of our publications. These initiatives are continuing in 2014.

For example, each year we publish an article entitled “News from the BIPM” in *Metrologia*. You will have seen it appear in the February 2014 edition. I have changed the emphasis in this publication. We now emphasize the most recent scientific achievements in this paper and report all of the rest of the work of the scientific departments on the BIPM webpages. Progress in all other areas is reported in the Director’s report, which was published on the website on 7 March 2014.

The next steps will be to make this scientific summary part of a single annual report and also to make “*BIPM e-news*” into a true electronic publication which is sent out by email only. I hope we will do this for the 2015 editions.

Another area where we have made a lot of progress is in the timeliness of the CIPM Report. The report of each session is now made available in English on the website as soon as it is completed. Subsequently, the French version is published when the translation is complete.

However, the publication of the decisions from the last session of the CIPM turned out to be more difficult than was expected. The *ad hoc* group requested that we publish these decisions shortly after the meeting. It was my view and also the view of the publication staff here, that the target for this was one week after the meeting. I hope it will be easier to get these completed this time although I will not be available to help the process.

The BIPM website is, of course, an essential part of our communications. It now contains a vast amount of information. For several years we have been preparing the way for the development of a new website. We have been studying the websites of the NMIs and other international organizations. Initially, we put the work of developing the new site out to tender. This was not an easy task since we want the site to have the latest software and functionality as well as to have a more modern look and feel. For these reasons we have had to separate the tasks of preparing the graphic designs from the task of preparing the software. The graphic design work includes all of the colours and fonts that we need for the website and has a direct consequence for the style we use for our BIPM presentations, posters, letters and even publications.

We have now found a company in Paris that has been able to come up with some possible designs. We tried out some of these designs last October on our posters and on some presentations and they were extremely well received – in fact we didn’t get any criticism at all. They are popular with BIPM staff too. I think you will return to this later in the agenda. I hope you will confirm that the approach we are taking is a good one.

## 5.7. CGPM

At the last session we discussed the plans for the General Conference. Céline Fellag and I visited the *Palais des Congrès* in Versailles again during December and saw a conference in progress there. It confirmed our view that this is going to be a good location. I am very pleased that we have now negotiated and signed a contract with the venue. Céline is now working very hard with her team here to organize all of the logistics. She has drawn up a very detailed plan of all the things we need to do.

In November, I wrote to the President of the *Académie des Sciences*, Prof. Philippe Taquet to ask him to be President of the Conference. He wrote back very promptly.

We have launched a webpage dedicated to the Conference – I hope you have looked at it. We have also emailed all of the NMI Directors and the Member States to let them know about it.

I also prepared a “Communication Plan” for the Member States to explain the actions we are going to take during 2014 to keep them informed about the conference. It was sent out on behalf of myself and the CIPM President in January. We don’t seem to have received any response from this so far – so I hope this means that the Member States are all pleased with our plans.

We did receive letters from three NMI Directors after the meeting in October 2013 with specific comments on the strategies, and, of course, we have replied to these.

## 5.8. Operations

The BIPM Quality System will be presented by Carlos Maggi, our Quality and Health and Safety manager to the EURAMET QS Forum on 9 April 2014. This is part of our commitment to the RMOs and the NMIs to demonstrate our quality system. As part of the preparation for this presentation, I have authorized a new version of the Quality Manual, and took the opportunity to eliminate a number of forms and procedures from the system.

As I mentioned at the last Session, I have started the development of a building strategy that will focus on the renovation of the Observatoire. The objective is to make the Observatoire into an inspiring and efficient working environment that will be a central point for our laboratory activities until at least 2030. This project has been progressed significantly in my absence by Robert Wielgosz. This will not involve any changes to the main laboratories, although we will be putting some offices into the less-used laboratories at the front of the building. This will put the scientists much closer to their labs, and also bring some life to the building. We expect to have some plans soon, but work will not start until after the General Conference.

We have reported at recent meetings that the BIPM electricity bill started to increase drastically from around the middle of 2011. I set up a group led by Carlos Maggi to look at all aspects of this. I am delighted that we have now identified that the problem was caused by the ageing electricity meter which was over-reading by about 40 %. EdF have now replaced it and we are preparing our claim for reimbursement of excess charges, which will amount, I hope, to several hundred thousand euro.

I am also pleased to report that we have started use of some new software to allow attendees at our meetings to register on-line. This has been tested at a few meetings and has been very successful. I hope we will use it across all meetings soon. The exception will always be meetings of Consultative Committees for which we insist on receiving nominations through NMI Directors in order to be sure that all those who attend have been correctly nominated.

## 5.9. Other matters

The IPK was removed from the caveau on 15 November 2013. This was done by me in the presence of the Secretary, who used the key left by the CIPM President, and Luc Énard, who used the key left with me by the representative from the French archives. The most important people were also there: that's Michael Stock, Pauline Barat and Richard Davis, who will be doing the real work.

I can say that the campaign of measurements has progressed very well. I have been receiving updates on progress with the data almost weekly. I am not able to tell you anything about the results at this point, although I will say that the improved repeatability achievable with modern automated mass comparators is evident when the data are compared with that from the third re-verification. It is also clear that the repeatability for the cleaning/washing process, when it has been used has been very good.

The Joint Committee for Guides in Metrology (JCGM) met here in December. I am delighted that the member bodies of the JCGM unanimously elected the BIPM to retain the Chair for the next 3 years. I have taken a particular interest in the JCGM since I became Director. I have kept in close contact with the Chairman and other members of the WG1 which deals with the Guide to the Expression of Uncertainty in Measurement (GUM). In particular I have read through their early draft for a revised GUM and given some specific suggestions as to how it can be made more "user friendly"; I think this is an important issue, since they are proposing a major change in the way that uncertainty calculations are carried out for very good technical reasons. But this change should not be seen as an added complication to most users.

Looking at the work of WG2 which deals with the International Vocabulary of Metrology (VIM), I am aware that in 2011, the CIPM instructed my predecessor to take their view to WG2 that work should be stopped on a “VIM4”. I know that view was not accepted. I have taken a different approach. I have worked hard with Chuck Ehrlich from NIST who is the Chair of WG2 to prepare a work programme for WG2 that clearly explains what the group plans to achieve in preparing a “VIM4”. This includes a list of how the VIM4 will differ in its basic approach from VIM3. This has all been summarized in a “revised work programme” for WG2 which has been circulated to all of the JCGM Member Bodies for their approval. I circulated it to the CIPM on 19 December. Since I have received no reply at all from the CIPM I assume that you are all in agreement, and the problems incurred in 2011 will not occur again.

The theme for World Metrology Day in 2014 is “Measurements and the global energy challenge”. The poster has been designed by KRISS, Republic of Korea, and is excellent. I think it will be very successful. In recent years the Directors of the BIPM and the International Bureau of Legal Metrology (BIML) have published a joint message. The BIML did not want to publish a joint message this year, so I have written my own BIPM message which is available from the “metrologyinfo.com” website.”

The President thanked the Director for his presentation and invited questions. It was noted that the JCGM ‘revised work programme’ for WG2 had been circulated to the CIPM on 19 December 2013. No replies had been received from the CIPM and it had been assumed by the BIPM Director that the CIPM agreed with the proposals. The CIPM commented that they would like more time to reflect on the proposals and requested the BIPM to recirculate the ‘revised work programme’ to ensure there are no further comments.

The Director confirmed that he is already investigating delays in key comparisons that are conducted sequentially. This negates the need for Dr Carneiro to convene a meeting of CC Executive Secretaries for this purpose, which arose as an action from the CC Presidents’ meeting held at the BIPM on 11 March.

**Decision CIPM/103-03** The CIPM requested the BIPM to recirculate the JCGM “revised work programme” for WG2 sent to CIPM members in mid-December 2013 to ensure they have no further comments.

**Decision CIPM/103-04** The CIPM, noting the action from the CC Presidents’ meeting requesting Dr Carneiro to convene a meeting of CC Executive Secretaries to draft a guidance document to address delays in this type of key comparison for presentation to the CIPM, decided that that action should be discontinued following information received from the Director of the BIPM that he is already addressing this issue.

## 6. REPORT FROM THE CHAIR OF THE CIPM STANDING SUB-COMMITTEE ON FINANCE

Dr Bowsher gave a report on the activities of the CIPM Standing Sub-Committee on Finance. It had met once since the last report, on 10 March 2014. Dr Bowsher had also met with Ms Andernack (head of the Finance, Budget and Procurement Office) on 26 February to prepare for this meeting. He commented that he has been impressed by the openness and level of engagement with those involved in the work of the Sub-Committee, particularly the BIPM finance team. Discussions on 26 February between Dr Bowsher and Ms Andernack included the most efficient use of the Sub-Committee and how to discharge its responsibilities back to the BIPM. The meeting on 10 March included a discussion on the condition of the BIPM finances. Dr Bowsher welcomed work by the finance team to resolve previous minor irregularities and also to embrace the spirit of accrual accounting. It was agreed that when the BIPM financial statements (both BIPM and pension) are ready they will be sent to the Sub-Committee on Finance for comment prior to final CIPM approval, which is anticipated to be through correspondence.

It was suggested that future interaction between the Sub-Committee on Finance and the Sub-Committee on the BIPM Pension and Provident Fund and Health Insurance will consist of the latter taking the lead on the policy for the BIPM Pension and Provident Fund and the Sub-Committee on Finance maintaining oversight for financial issues concerning the pensions, including review of the Financial Statements.

The Sub-Committee welcomed the changes to presentation of the 2014 budget which improved the clarity of reporting, particularly through the separation of the budget at the laboratory level rather than by department.

## 7. FINANCIAL AND ADMINISTRATIVE MATTERS

Ms Andernack, head of the Finance, Budget and Procurement Office, joined the meeting and presented her report. Preparation of the BIPM financial statements was under way and no major issues are anticipated. The external auditor will be on-site at the BIPM during the week beginning 31 March 2014 to carry out the audit.

The 2014 budget included a significant increase in the allocation to cover the cost of electricity. This was in response to rising consumption over recent years that was documented in §6.5 of the report of Session I of the 102nd meeting of the CIPM and §12.2 of the report of Session II of the 102nd meeting of the CIPM. Since these reports were published, further investigations into the increase in electricity consumption found that the meter installed by the electricity supplier at the BIPM was faulty. Following the investigation, the electricity supplier visited the BIPM and agreed to change the meter. The BIPM is preparing a claim for reimbursement.

Dr Bowsher, the chair of the CIPM Standing Sub-Committee on Finance, commented that the stronger strategic drive to the latest long-term financial plan for the BIPM has been welcomed by the Member States. He cautioned that the decision over the proposed dotation for 2016-2019 is likely to be a political decision and early engagement of those concerned is essential to gain their support and could be more important than waiting for the final version of the long-term financial plan. He suggested that the CIPM should reflect on the key messages that they want to convey in the long-term financial plan and that when arguing the case for the dotation, the process should be backed-up with “scenarios” for the different levels of the dotation.



Ms Andernack reported that the mandate between the BIPM and its investment bank regarding the pension fund assets will be signed in the near future. The international actuary company (Mercer) presented its report on the investment policy for the pension fund assets at the November 2013 meeting of the Sub-Committee on the BIPM Pension and Provident Fund and Health Insurance. The report noted that the current policy of investing 75 % in bonds and 25 % in equity was a good balance and should continue.

There are currently no Member States in financial arrears for more than three years. The Dominican Republic and the Islamic Republic of Iran have paid their contribution and rescheduling payment for 2012 but not for 2013. There has been no contact with the Dominican Republic which has paid neither its 2013 contribution nor its 2013 rescheduling payment. If this remains the case for 2014, their prerogatives and advantages will remain suspended and they will not be entitled to attend the 25th CGPM meeting. *Notes verbales* will be sent to the respective embassies to notify them that they will be excluded if their arrears are not paid by the end of 2014.

Sri Lanka is the only Associate of the CGPM that has been in financial arrears for more than two years and is close to triggering the rules for exclusion.

## 8. REPORT FROM THE CHAIR OF THE CIPM AD HOC WORKING GROUP ON CIPM MEMBERSHIP

Dr May gave a progress report on the document '*Criteria and Process for Election of CIPM Members*'. The document had been modified in response to comments made during the NMI Directors and Government Representatives meeting on 23-24 October 2013. The document '*Criteria and Process for Election of CIPM Members*' was still subject to changes which will be addressed in Draft Resolution B to the CGPM '*On the election of the International Committee for Weights and Measures*'.

Dr May's report and the subsequent discussion referred to the requirement that a formal procedure for the collective resignation of the CIPM is needed in order to initiate the new election process. The document '*Criteria and Process for Election of CIPM Members*' is clear that beginning with the 25th CGPM meeting, CIPM members will be elected to a term that begins six months following their election and ends six months after the following CGPM meeting. Thus all CIPM positions will be open for election at each General Conference and CIPM members will commit to resign their positions to follow this process. It was noted that the newly-elected CIPM will begin its term at its first meeting, no more than six months after its election at the CGPM meeting. The current CIPM will remain in office until this time.

The possibility of introducing a fixed-term of four years for CIPM members was raised. However, the time between CGPM meetings can be any period up to and including six years. It was noted that Article 8 (1921) in the Regulations annexed to the Metre Convention states that "*At the time of renewal of half of the International Committee, the outgoing members shall be first those who, in the case of vacancies, have been provisionally elected in the interval between two sessions of the Conference; the others shall be drawn by lot.*" The proposal that all CIPM members will agree under the new process, at their first meeting, to resign after a four-year term would *de facto* satisfy the existing rule for renewal of half the CIPM.

**Decision CIPM/103-05** The CIPM decided to convene a group composed of Ms Arlen, Dr May, Dr McLaren and Dr Quinn to review the wording of the Draft Resolution on the election of the CIPM.

There were concerns expressed by a delegate from Norway regarding the election process. He had suggested that all relevant documents relating to each candidate should be handed over to the Committee for CIPM Election and that Steps 1 and 2 in Section D '*Election Process for CIPM Members*' should be handled by the Committee for CIPM Election rather than allowing the CIPM to review the material and submitting its preferred list of candidates. The concerns stem from the fact that many of the candidates will be existing CIPM members and there could be some bias. The CIPM reflected on the Norwegian proposal noting that the Election Committee will develop the definitive list of candidates. The CIPM concluded that it should consider including the modification to the process suggested by Norway (along with others that might come forward) if such is warranted after the new process is exercised for the first time at the 25th CGPM meeting.

**Decision CIPM/103-06** The CIPM decided that, in response to the Norwegian concerns on aspects of the *Criteria and process for election of CIPM members* document, a letter will be prepared to be included in the CIPM minutes and charged the President of the CIPM to convey the message to Norway.

See Appendix 2 for the text of the letter.

Dr Kaarls reported that a letter had been sent to NMI Directors and government representatives of Member States in late January 2014 inviting them to propose the names of potential candidates fulfilling the criteria as indicated in the document '*Criteria and Process for Election of CIPM Members*'. The exercise resulted in four new names being added to the pool of candidates.

Concerns were expressed that the call for potential CIPM members had generated so few candidates. It was agreed that a second round of communication to Member State representatives and NMI Directors will be initiated by the CIPM Secretary by early April 2014 in an attempt to obtain the names and CVs of additional candidates.

**Decision CIPM/103-07** The CIPM charged the CIPM Secretary to initiate by early April 2014 a second round of communication to Member States representatives and Directors of National Metrology Institutes seeking their continuing support to nominate potential candidates.

Dr Kaarls reminded those members of the CIPM who intended to seek re-election, that they should submit their CVs and supporting documentation to him.

The head of the BIPM Legal, Administration and Human Resources Office had drafted a 'collective resignation letter' for all CIPM members to sign. After a discussion on the text, the document was approved unanimously. All 16 CIPM members present duly signed the letter. It was agreed that a copy of the signed resignation document would be sent to the two absent CIPM members to sign and return.

**Decision CIPM/103-08** Following Decision CIPM/102-31, the CIPM in its meeting unanimously supported the proposed text on the planned resignation process for CIPM members required to implement the revised rules and procedure for election of CIPM members that will be submitted to the General Conference on Weights and Measures (CGPM) at its 25th meeting.

**Decision CIPM/103-09** The CIPM charged the CIPM Secretary to send a copy of the resignation document signed by the 16 members present at Session I of the 103rd meeting of the CIPM to the two absent members for them to sign and send it back as soon as possible.

Dr Kaarls reported that the recommended list of candidates will be drawn up after 25 May 2014. The CVs of all eligible candidates will be reviewed against the criteria for election of CIPM members. The CIPM will agree in principle (by correspondence) which 18 are the preferred candidates it will recommend to the Committee for CIPM Election. The recommended list will be submitted along with the CVs and supporting information for all candidates. The Committee for CIPM Election will submit a recommended list of candidates to the CGPM.

It was suggested that if a candidate is not considered to be suitable for inclusion on the recommended list, a brief note should be produced explaining why.

Dr May thanked the CIPM for their input into the document '*Guidelines for Selection of CIPM Consultative Committee Presidents*' and encouraged them to send him any further comments. The proposed criteria and selection process will be integrated into document CIPM-D-01, for approval by the CIPM at its November 2014 meeting.

He reported that Dr Richard (President of the Consultative Committee for Mass and Related Quantities (CCM)) has proposed the inclusion of a section in the document to cover creation of new CC Working Groups and the closure, merger and confirmation of active Working Groups.

**Decision CIPM/103-10** The CIPM charged the Working Group on CIPM Membership to come forward with proposed criteria and selection process of CC Presidents and good practices for the appointment of CC Working Group Chairpersons and Deputies, to be integrated into document CIPM-D-01, for approval by the CIPM at its November 2014 meeting. A proposal made by Dr Richard to include a section in the document to cover the creation of new CC Working Groups and the closure, merger and confirmation of active Working Groups will be further considered by the Working Group on CIPM Membership and the CIPM.

Dr May also reported that a first draft of the criteria for CC membership and observership has been prepared by the *ad hoc* Working Group on CIPM Membership for inclusion in document CIPM-D-01. The revisions will be circulated to the CIPM for comment.

The CIPM bureau tasked Ms Arlen, Mr Henson and Dr Kaarls with developing a draft for the criteria and process needed for the election of Member State representatives to the [CGPM] Committee for CIPM Election.

## **9. PROCESS OF COMMUNICATION, CONSULTATION AND EXCHANGE OF INFORMATION AND OPINIONS WITH THE NMI DIRECTORS AND MEMBER STATE REPRESENTATIVES IN PREPARATION FOR THE 25TH CGPM MEETING**

The attendees at the NMI Directors and Government Representatives meeting held on 23-24 October 2013 had commented that it would be useful to hold a preparatory meeting in the second quarter of 2014. During email discussions amongst the CIPM in December 2013 it became clear that many NMI Directors would be unable to attend such a one-day meeting. Therefore it was decided not to hold one.

Consequently, the President of the CIPM and the Director had prepared a document '*BIPM Communication Plan to Member State Representatives and NMI Directors for 2014*' which was circulated in January.

## **10. DEVELOPMENT OF THE BIPM WORK PROGRAMME (2016-2019) AND STRATEGY**

Mr Henson presented the draft BIPM Work Programme for 2016-2019. It was noted that this is a working document and that the consultation process with the Member States is under way. The draft was well received by the CIPM. The main points of the discussion were:

- The juxtaposition of key activities and the strategy as well as the layout and sectorial approach was well appreciated.
- An overview of the Work Programme should be presented to the CGPM, with less detail.
- Inclusion of the justification of the activities carried out at the BIPM (rather than elsewhere) already presented in the Consolidated Planning Process would be useful.
- The basis on which Member States are being asked to comment will need to be made clear when they are consulted (particularly with respect to the optional projects), perhaps with consideration of which projects would need to be cancelled to allow others to proceed.
- The value of secondments from NMIs to the BIPM should be emphasized.
- A summary of the expected impact from the programme should be mentioned.

The draft Work Programme will be made available online around the end of April 2014 to continue the consultation process with the Member States. An alert will be sent to the Directors of NMIs and Designated Institutes (DIs) as well as Member State Representatives.

The alternative Time activity “T-A3.3 Frequency comb validation” in the proposed BIPM Work Programme was discussed. It was noted that if this is being considered as an alternative activity, the proposed expenditure shown in the Work Programme is insufficient; therefore the proposed optical project could only be retained as a “watching brief”. It was commented that optical frequency combs are growing in importance as tools for the realization of the length unit. The absence of a formal validation programme for those measurement systems at the heart of the realization of the SI base unit deserves further consideration in the BIPM Work Programme. It was further noted that frequency comb validation is not supported by the Consultative Committee for Time and Frequency (CCTF) because it is carried out efficiently in a number of NMIs.

Dr Louw suggested that the alternative chemistry activity “A2.1.4 Small Molecule Organic Primary Reference Comparisons (Pure Materials)” should be considered for inclusion in the Work Programme.

**Decision CIPM/103-11** The CIPM supported the proposed BIPM Work Programme for the years 2016 to 2019 as a basis for the final document and charged the Director of the BIPM and Mr Henson to take the CIPM members comments into account.

The CIPM decided that the Work Programme would be opened online to Member States for comments and the consultation be brought to the attention of the Directors of National Metrology Institutes and Designated Institutes.

The CIPM decided that the alternative Time activity “T-A3.3 Frequency comb validation” in the proposed BIPM Work Programme would remain an optional project. The CIPM requested the Director of the BIPM to review the costs and scope of the project. Optical frequency combs for the realization of the length unit are, and will become, even more important and decisive tools. The absence of a formal validation programme for those measurement systems at the heart of the realization of the SI base unit must be seen as unsatisfactory and deserves closer consideration of the CIPM and BIPM in the BIPM Work Programme.

The CIPM requested that consideration be given to including the alternative Chemistry activity “A2.1.4 Small Molecule Organic Primary Reference Comparisons (Pure Materials)” in the Work Programme.

## 11. CIPM MRA REVIEW PROCESS

The President of the CIPM introduced the proposed review process. Within the existing framework of the CIPM MRA a number of useful improvements in efficiency have been achieved through the CC Strategy exercise and as a result of the 2012 Calibration and Measurement Capabilities (CMC) Workshop held by the JCRB. Nevertheless, the CIPM has committed to a much wider ranging review of the efficiency and effectiveness of the CIPM MRA and its implementation, and initially proposed a way forward in its Decision CIPM/102-44.

Given the importance of engagement with the NMI Directors as primary stakeholders in the CIPM MRA, the CIPM decided that the BIPM will hold a meeting of NMI Directors in 2015 dedicated to the CIPM MRA review. The intention would be to focus on the benefits the CIPM MRA, as well as establishing views on what works well, and what needs to be changed. The topic will be addressed from the perspective of the “owners” (NMI/DI Directors), with contributions from representatives drawn from the “operators” (NMI experts, CCs, JCRB, RMOs and the BIPM) and “users” (invited speakers from the key stakeholders such as ILAC and industry). Each party is to be invited to consult their communities focusing on their specific area of concern so as to establish and express their views beforehand. Terms of Reference of the review committee referred to in CIPM Decision CIPM/102-44 would be developed at the workshop.

Draft Resolution E ‘*On the importance of the CIPM Mutual Recognition Arrangement*’ was presented (see §13.5).

**Decision CIPM/103-12** The CIPM charged the BIPM to hold a meeting of NMI Directors in 2015 dedicated to the CIPM MRA review focusing on the benefits of the CIPM MRA, as well as establishing views on what works well, and what needs to be changed. Representatives from other key stakeholder groups will be invited to present their views. In the meantime, the CCs and the JCRB will be encouraged to continue their ongoing efforts to streamline operations within the existing framework, and prepare for the wider review in 2015.

The Consultative Committee for Amount of Substance: Metrology in Chemistry (CCQM) has already carried out a questionnaire on the CIPM MRA and the possibility of using this as a template for the wider review was discussed, but not supported.

The JCRB is expecting to receive feedback on the CIPM MRA from the Regional Metrology Organizations (RMOs) later in 2014.

The CIPM MRA document (CIPM MRA-D-05) ‘*Measurement comparisons in the CIPM MRA*’ version 1.5 had been subject to minor revisions (update of links and modification and improvement of the Registration and Progress Form for comparisons).

**Decision CIPM/103-13** The CIPM approved the revised document CIPM MRA-D-05, version 1.5.

## 12. PLANS FOR THE 25TH CGPM MEETING (2014)

Dr Kaarls presented the plans for the 25th CGPM meeting. It was suggested and agreed that the timetable for the preparation day ahead of the CGPM meeting, to be held at the BIPM on 17 November 2014, should be reversed so that the preparatory meeting on the Dotation of the BIPM is held in the morning,

followed by the laboratory tours. This will ensure that the preparatory meeting has sufficient time to complete its discussions.

Since there will be limited space at the preparatory meeting the number of attendees will need to be limited. It was agreed that the CIPM President and Secretary will prepare a communication to the Member States on the formation of the Working Group on the Dotation of the BIPM, taking into consideration Member States with maximum, intermediary and minimum contributions, properly balanced to represent all regions. It was noted that the calculation of the contribution of each Member State is based upon its United Nations (UN) coefficient. These coefficients have changed significantly since the 24th CGPM meeting and should be taken into consideration for participation in the Working Group on the Dotation of the BIPM.

**Decision CIPM/103-14** The CIPM accepted the provisional timetable for the CGPM meeting and decided that the [informal] preparatory meeting on the Dotation of the BIPM will take place on the morning of Monday 17 November 2014 (lab tours and presentations to follow in the afternoon).

The CIPM charged the CIPM President and Secretary to prepare a communication on formation of the Working Group on the Dotation of the BIPM to be sent to Member States.

The formal Working Group on the dotation of the BIPM will meet on Wednesday 19 November 2014.

The CC Presidents had discussed the preparation of templates for their written reports and presentations to the CGPM at their meeting on 11 March 2014. A consensus was reached on the need to achieve uniformity of presentation, with a focus on the CC's work, impact for society and industry, and grand challenges. Mr Henson was asked to coordinate preparation of guidelines on what form the oral and poster presentations should take.

### **13. POSSIBLE RESOLUTIONS TO BE SUBMITTED TO THE CGPM**

#### **13.1. Revision of the International System of Units, the SI (see CCU Recommendation CCU 1 (2013))**

The text of Draft Resolution A was accepted by the CIPM.

#### **13.2. On the election of the CIPM**

Dr Quinn expressed a concern that Draft Resolution B contains the wording '*beginning with the 25th meeting of the CGPM, CIPM members shall be elected to fixed renewable terms*'. If the CGPM decides that the CIPM is elected to a fixed but renewable term, this may not be compatible with the Metre Convention. The head of the BIPM Legal, Administration and Human Resources Office commented that the wording of the proposed Draft Resolution does not change the underlying election process outlined in the Metre Convention. The actual modality of the election process can be decided by the CGPM.

Following minor revisions, the text of Draft Resolution B was accepted by the CIPM.

### 13.3. On the Pension and Provident Fund of the BIPM

The discussion centred on whether Draft Resolution C should contain information about measures that have already been taken to improve the long-term financial stability of the BIPM Pension and Provident Fund. Many Member States will be unaware that the BIPM had already taken significant steps that were agreed in 2009 and implemented from 2010, including raising the retirement age and increasing the staff contribution. It was agreed to include this information in the Draft Resolution.

The Draft Resolution mentions the establishment of a Supervisory Board for the Pension and Provident Reserve Fund with members that are representative of the interests of the relevant stakeholders. It was queried whether pensioners should be involved in the management of the pension fund and if the situation is the same in other international organizations' pension schemes. The current situation is that because pensioners are beneficiaries of the fund, they do not have a role in its operation: it is overseen by current contributors. Dr Bock (external member of the CIPM Standing Sub-Committee on the BIPM Pension and Provident Fund and Health Insurance) is investigating the situation in other organizations and is drafting a proposal for the Supervisory Board and its membership.

The text of Draft Resolution C was accepted by the CIPM.

### 13.4. Dotation of the BIPM for the years 2016 to 2019

There were no changes to the text of Draft Resolution D which was accepted by the CIPM.

### 13.5. On the importance of the CIPM MRA

It was noted that Draft Resolution E should include information about the planned workshop in 2015 to engage in a broad discussion of the CIPM MRA and the proposal to carry out a review of the effectiveness and efficiency of the CIPM MRA in 2015.

The text of Draft Resolution E was accepted by the CIPM.

### 13.6. Other Draft Resolutions

It was suggested that a Resolution should be drafted to highlight developments in metrology over the last few years to acknowledge that this is a dynamic area that has made significant advances. The CIPM charged the Director of the BIPM, Mr Henson and Dr Wielgosz to develop the text for such a Draft Resolution.

**Decision CIPM/103-15** The CIPM approved the proposed text with the agreed changes for the five Draft Resolutions to be submitted to the General Conference on Weights and Measures (CGPM) at its 25th meeting (2014). The CIPM charged the Director of the BIPM, Mr Henson and Dr Wielgosz to come forward with a Draft Resolution on the impact of metrology.

**14. REPORT FROM THE CHAIR OF THE CIPM STANDING SUB-COMMITTEE ON THE BIPM PENSION AND PROVIDENT FUND AND HEALTH INSURANCE**

This report was given during the *in camera* session. See §2.

**15. REPORT FROM THE CHAIR OF THE CIPM AD HOC WORKING GROUP ON BIPM CONDITIONS OF EMPLOYMENT**

This report was given during the *in camera* session. See §2.

**16. THE ROLE AND PERFORMANCE OF THE CIPM AS A SCIENTIFIC BODY AND A DIRECTION-GIVING AND SUPERVISORY BODY OF THE BIPM**

Prof. Valdés gave a presentation on the role and performance of the CIPM as a scientific body and a direction-giving and supervisory body of the BIPM. The scientific role of the BIPM and CIPM were recalled, including the need for the CIPM to discuss and instigate fundamental metrological activities between CGPM meetings. The current status of the CIPM's scientific activities on the run up to the 25th CGPM meeting was highlighted. Resolution 1 of the 24th meeting of the CGPM (2011) '*On the possible future revision of the International System of Units, the SI*' invited the CIPM to continue its work towards improved formulations for the definitions of the SI base units in terms of fundamental constants, having as far as possible a more easily understandable description for users in general, consistent with scientific rigour and clarity. The CIPM should discuss and report to the next CGPM meeting on possible improved formulations for the definitions of the SI.

Prof. Valdés had asked for the opinion of Dr Richard (President of the CCM) and the mass metrology community during Session II of the 102nd meeting of the CIPM on the issue of redefining the kilogram by fixing  $h$  or by fixing the mass of an atom. At the time Dr Richard commented that the CCM is aware of this issue and an atomic definition of the kilogram had been considered. However, the CCM has decided that the choice between a definition of the kilogram based on the mass of an atom or a definition based on the Planck constant will have negligible impact on mass metrology.

It was noted that the CIPM has to discuss the pros and cons and decide well before 2018 on a proposal to the CGPM. The CCs should not only bring a given majority position to the CIPM, but also the essentials of the different positions, facilitating a CIPM decision on a scientific basis.

The CIPM could report to the CGPM at its 25th meeting that, in agreement with Resolution 1 (2011) of the CGPM, it has taken note of new experimental measurement results, giving rise to new proposed formulations for the redefinition of the kilogram that should be urgently considered at the next meeting of the CIPM. New experimental results of other constants involved in the redefinitions should be addressed in the reports of the CC's to the CGPM.

The President thanked Prof. Valdés for his presentation and noted that new methods of measuring physical constants will continue to emerge and will be given due consideration by the CIPM.



It was commented that the Planck constant should continue to form the basis of the planned redefinition of the kilogram, although the scientific community should be encouraged to continue research into new methods of realizing it. It was further commented that the CIPM, as a scientific body, has a responsibility to debate and report on work by eminent scientists in the field of metrology. The CIPM has a broader responsibility than simply organizing comparisons of national standards.

**Decision CIPM/103-16** The CIPM welcomed the presentation by Prof. Valdés on “The role and performance of the CIPM as a scientific body and a direction giving and supervisory body of the BIPM” and acknowledged its responsibilities to instigate and review fundamental metrological activities. In this context the work he mentioned addressing atom interferometry that was suggested in a recent paper to be among the potential ways to redefine the kilogram was noted by the CIPM. The CIPM encouraged further discussions on scientific issues during the course of CIPM meetings.

## 17. PROPOSED AMENDMENTS TO THE SI BROCHURE

Prof. Ullrich, in his capacity as Consultative Committee for Units (CCU) President, gave a presentation on the proposed changes to the 8th edition of the SI Brochure. The changes included updating references to standards and guides and a modification of the order of base units in the expression of derived units. The changes are intended to make the SI Brochure more consistent with the ISO 80000 series of standards. There was a brief discussion and the CIPM supported the changes.

He mentioned the proposal to specify units for very small angles for use in astronomy. The proposal would involve the inclusion of the units ‘milliarcsecond’ and ‘microarcsecond’ in Table 6 ‘*Non-SI units accepted for use with the International System of Units*’ of the 8th edition. It was noted that if these quantities are included in the table it could set a precedent for including similar units. The CIPM rejected this proposal.

The CCU President recommended that a short summary of the updates should be printed and inserted into the remaining printed copies of the 8th edition of the SI brochure rather than waiting until the 9th edition is published. The revised content could be inserted into the SI brochure on the BIPM website.

The 9th edition of the SI brochure is scheduled for publication in 2018. Chapters one, two and three of the first draft are available at [http://www.bipm.org/utls/common/pdf/si\\_brochure\\_draft\\_ch123.pdf](http://www.bipm.org/utls/common/pdf/si_brochure_draft_ch123.pdf). The CCU President asked the CIPM to invite the CCs to comment on the chapters by March 2015.

The CCU President presented a proposed logo for the new SI: the initiative was supported by the CIPM.

He also proposed that Prof. Mills, the former CCU President, should be appointed as an honorary member of the CCU. The CIPM discussed the proposal and noted that there are no terms of reference for appointment as an honorary member of a CC; any such proposals would have to be discussed on a case-by-case basis. Such an appointment would have to be in recognition of outstanding contributions and should not become an automatic right for CC Presidents when they stand down. In this case, the CIPM agreed to appoint Prof. Mills as an honorary member of the CCU, in view of the unique and outstanding contributions he made during his 17 years as CCU President.

**Decision CIPM/103-17** In the framework of the updating of the 8th edition of the SI Brochure, the CIPM approved the modification of the order of base units in the expressions of derived units. It did not approve the need to specify units for very small angles for applications in astronomy in the SI Brochure. The CIPM

accepted the proposed publication process for the updates and the recommendation to proceed with amending the document on the website and producing a short printed summary of the updates.

The CIPM invited Consultative Committees to comment on chapters 1 to 3 of the Draft Version of the 9th edition of the SI Brochure by March 2015.

The CIPM supported the initiative of the CCU President for a new logo for the SI.

In recognition of Prof. Mills' unique and outstanding contributions to metrology and Metre Convention activities while President of the CCU, and the very broad impact of his contributions, the CIPM appointed him as an honorary member of the CCU.

## 18. OTHER BIPM ISSUES

### 18.1. BIPM Policy on Support from Third Parties

Dr Wielgosz presented the latest draft of the document '*BIPM Policy on Soliciting and Accepting Support from Third Parties*' for approval. The previous draft of the document had been reviewed by the CIPM bureau following its presentation to the CIPM in October 2013.

**Decision CIPM/103-18** The CIPM approved the document BIPM Policy on soliciting and accepting support from Third Parties.

### 18.2. Donation of a NMR device to the BIPM

Dr Wielgosz commented that the document '*BIPM Policy on Soliciting and Accepting Support from Third Parties*' was being used as the basis for negotiations with a NMR equipment manufacturer that is planning to donate an instrument to the BIPM. The donation agreement is expected to be finalized over the next few months. The work will be supported by a collaborative agreement with the NMIJ, Japan.

### 18.3. Funding for the Joint Committee for Traceability in Laboratory Medicine (JCTLM)

Dr Wielgosz also presented the document '*JCTLM: The Next Phase? Ad-hoc JCTLM Executive Committee WG on JCTLM Structure*'. The document explored the issues raised by the *ad hoc* Working Group on the future evolution of the JCTLM organizational structure, to best meet the challenges it expects to face. The document achieved this by posing a series of 18 questions and suggesting draft responses. It was noted that the *ad hoc* Working Group had been established following discussions by the JCTLM Members and Stakeholders meeting and the JCTLM Executive.

Dr Wielgosz asked the CIPM to comment on the document and the 18 questions and draft responses. Discussions focused on questions 10, 11 and 12, which dealt with funding the database and reimbursing the travel and accommodation costs for Review Team Leaders to attend annual meetings. Dr Wielgosz commented that the work of the JCTLM Review Teams and the JCTLM Secretariat represent the two major resource intensive activities and the success of the JCTLM relies on the work of the Review Team Leaders. The work of the JCTLM Review Teams is voluntary and any costs have been borne by the Review Team Member's home organizations which have agreed to them undertaking these activities. The annual JCTLM Working Groups' meetings are most effective if they are attended by at least the

Review Team Leaders. After a brief discussion, the CIPM supported the 18 questions and draft responses proposed in the document.

Dr Wielgosz asked the CIPM to consider whether the JCTLM processes can be modified or improved to reduce the 85 person-days of effort required by the Secretariat to maintain the database. He commented that operating the JCTLM requires 50 % of a staff member's time each year. It is estimated that this effort could be halved with more automation or streamlining of processes, although there would be an associated cost. Half the cost of the JCTLM is currently borne by the International Federation for Clinical Chemistry and Laboratory Medicine (IFCC) but it has indicated that it will not be able to sustain this level of support beyond 2014-2015. Many of the member organizations of the JCTLM provide support through staff time spent on JCTLM activities but do not provide any funding for the database. Dr McLaren asked what percentage of JCTLM users were from 'for-profit' organizations and whether they could be approached for one-off funding. Dr Wielgosz noted that alternative sources of external funding are being considered to carry out the work, including companies and foundations. The CIPM encouraged the BIPM initiative to seek one-off funding to support automation or streamlining of the processes involved in the JCTLM database.

There was a brief discussion on whether the BIPM should continue to provide the JCTLM Secretariat and the possible consequences of this role ending. The CIPM supported the ongoing role of the BIPM as the JCTLM Secretariat.

**Decision CIPM/103-19** The CIPM supported the continued role of the BIPM as JCTLM Secretariat and approved the draft responses to the JCTLM questionnaire. The CIPM encouraged the BIPM to seek one-off funding to support streamlining the processes and evolution of the JCTLM database.

#### 18.4. New BIPM website and designs

Mr Henson presented the rationale for changing the design of the BIPM logo. The redesign fits in with the wider initiative for the renewal of the website. The current logo does not scale well and the design incorporating the swirl has been in use for 15 years and is looking dated. The proposal is only to replace the logo which depicts the Pavillon de Breteuil: the logos for the CIPM MRA, BIPM key comparison database (KCDB) and JCTLM will remain unchanged. Feedback on the new logo has been positive although concerns were raised by the CIPM bureau that it does not use the BIPM acronym, which could result in some loss of identity. This led to a further review of the proposed logo. It was noted that the originally proposed bronze-coloured logo worked well on printed products but was difficult to reproduce on screen and the bureau had recommended opting for the blue alternative. The 'macaron' logo will continue to be used. The CIPM discussed the new logo and agreed to its adoption.

Mr Henson gave a brief presentation of the refreshed website design and its features. The final design of the logo can be protected legally and integrated into the web refresh now that it has been approved.

**Decision CIPM/103-20** The CIPM agreed to adopt the proposed new BIPM logo (noting that the CIPM MRA, KCDB and JCTLM logos will not change and that the "macaron" will continue to be used).

#### 18.5. Policy on Guest Laboratory Participation (BIPM letter of acceptance and agreement)

Dr Wielgosz presented the document '*Participation in CCQM Pilot Studies: Request form for guest laboratories*' and explained the proposed policy on the subject. The background to the policy was given and it was noted that the CCQM undertakes many pilot studies which often include guest laboratories. Guest laboratories will be required to read and sign the policy. The policy, letter of acceptance and

agreement could be adapted for use by other CCs. There was a brief discussion and the CIPM approved the policy.

**Decision CIPM/103-21** The CIPM approved the proposed policy on guest laboratory participation in CCQM pilot studies.

## 18.6. BIPM building works and IT facilities

Dr Wielgosz gave an update on the building work and improvements to the BIPM's IT facilities. The reconfiguration and refurbishment work on the office space in level -2 of the Nouveau Pavillon is well advanced. This new suite of offices will house the staff of the Director's Office.

Work on renovating the Observatoire building will begin in the near future. The Observatoire will become the main suite of laboratories and offices for the physical metrology theme. A consultation exercise was carried out with the BIPM staff to determine their opinions on the building and what they would like to see included in the renovation. The impact of the building work on the ongoing laboratory activities in the Observatoire is being considered.

Dr Wielgosz reported that the BIPM fibre optic network has been renewed and two new data rooms have been created. The BIPM is reviewing the way it manages meetings. This follows an increasing number of requests for electronic meetings and electronic sharing of documents. The extra work required to manage the associated software was noted. A video conferencing facility at the BIPM is under consideration, although extra funding and staff resources would be needed.

## 19. INTERNATIONAL COOPERATION

Mr Henson reported that during the bilateral meeting of the BIPM and the International Laboratory Accreditation Cooperation (ILAC) on 5 March 2014, the ILAC requested the BIPM to write to NMI Directors to encourage them to operate laboratory comparison schemes with leading industrial companies because those that have their own primary realizations find it hard to validate their very low uncertainties. The view in the meeting and in the CIPM bureau was that this is not the BIPM's role. The CIPM indicated that it should be discussed at the CIPM MRA review meeting with the NMI Directors in 2015.

The ILAC noted during the bilateral meeting that it had received a joint letter from the Inter American Accreditation Cooperation (IAAC) and the Inter-American Metrology System (SIM) related to the ILAC P10 document. They requested an extension to the one-year implementation period for ILAC P10 which had been published in early 2013. The extension was rejected by ILAC because this period had been agreed as part of the vote on P10. The letter came to the attention of the BIPM because it indicated that there were a number of delays in CMC processing that were believed to be due to the BIPM. The processing of CMCs by the BIPM was explained thoroughly at the ILAC meeting and it was noted that the process had been misunderstood and the delays were not due to the BIPM.

Mr Henson noted that the quadripartite meeting between the BIPM, ILAC, the International Organization for Standardization (ISO) and the International Organization of Legal Metrology (OIML) on 6 March 2014 was attended by the Secretary of ISO CASCO and there had been a valuable discussion on areas of

common interest. ISO has a number of technical specifications in development which could not be released as full standards due to unresolved measurement issues.

The cooperation with the Versailles Project on Advanced Materials and Standards (VAMAS) had been discussed at the CC Presidents meeting on 11 March 2014. These discussions included the possibility of creating a new CC for materials metrology. There was general agreement at the CC Presidents meeting on the need to organize a joint workshop with key people from VAMAS to identify areas for cooperation and to reflect on the most efficient way to work collectively.

Mr Henson also noted that there continues to be very good cooperation between the BIPM and the OIML.

## **20. MEETINGS AND WORKSHOPS**

### **20.1. Future BIPM Workshops**

Dr Wielgosz informed the CIPM of two forthcoming workshops at the BIPM. The CCQM workshop on the redefinition of the mole will be held on 9 April 2014. The President of the CCU will attend the workshop which will discuss the expectations of the various interested parties in the redefinition.

The two-day CCQM workshop on “Global to Urban Scale Carbon Measurements” will be held at the BIPM in May or June 2015. An expected output will be a report following the model of the World Meteorological Organization (WMO)-BIPM workshop report from 2010. The workshop may also give further consideration to the establishment of a task driven Joint Committee; the possibility of establishing such a Committee had already been proposed by several participants at the WMO-BIPM workshop. The timing of this workshop is significant as precedes the 21st Conference of the Parties on Climate Change (COP21) and the 11th meeting of the Parties to the Kyoto Protocol (CMP11) which will be held in Paris on 30 November to 11 December 2015.

## **21. ANY OTHER BUSINESS**

### **21.1. Terminology**

Following a request to add an agenda point on BIPM terminology by Dr Quinn, presentations on the subject were given by Dr Quinn and Ms Arlen, head of the BIPM Legal, Administration and Human Resources Office. Dr Quinn disagreed over the correct use of terminology when referring to the name of the organization and the CGPM and its meetings. It was agreed that this issue must be resolved so that clear guidance can be given. The CIPM requested Ms Arlen and Dr Quinn to prepare notes on terminology which will be forwarded to the CIPM and which will be considered by the CIPM bureau at its meeting in June 2014. The CIPM bureau will prepare a recommendation which will be submitted to the CIPM in November 2014.

**Decision CIPM/103-22** The CIPM charged Ms Arlen and Dr Quinn to prepare notes on terminology to be forwarded to the CIPM and to be considered by the bureau at its meeting in June 2014. The CIPM bureau will prepare a recommendation to be submitted to the CIPM in November 2014.

## 21.2. Outcome of the Royal Society meeting on $G$

Dr Quinn presented a paper on the outcome of the Royal Society meeting on the gravitational constant ( $G$ ) held at Chicheley Hall, UK, on 27-28 February 2014. The problem of arriving at a reliable value for  $G$  in the face of the wide dispersion of results (450 ppm, more than ten times the sigma of the individual results) is unlikely to be resolved by one or two additional results being obtained by teams working independently.

It was proposed by the Royal Society meeting that to resolve the problems associated with teams working independently, an international advisory board be created, made up largely of those who have already carried out a  $G$  experiment, to advise on the choice of method or methods, on the design of the experiment, on its construction and finally on the interpretation of the data and calculation of the results. The international advisory board would follow a similar model to the International Avogadro Coordination (IAC) project which successfully achieved high-level results.

The CIPM welcomed Dr Quinn's presentation and the proposal to establish an advisory board on  $G$  experiments but required more time to reflect on the subject as this agenda point was not planned and the presentation had not been provided in advance. A formal proposal will be discussed by the CIPM at Session II of its 103rd meeting in November 2014. Dr May noted that the NIST team working on the determination of  $G$  fully supported the proposal for an advisory board.

**Decision CIPM/103-23** The CIPM would welcome the presentation of a formal proposal on the creation of an advisory board on  $G$  experiments at its next meeting.

## 22. DATE OF NEXT MEETING

Session II of the 103rd meeting of the CIPM will be held on 13-14 November 2014.

## 23. CLOSURE OF THE MEETING

The President thanked the BIPM staff for their support during the meeting. He wished everyone safe travel and closed the session.

## Appendix 1

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

(October 2013 – March 2014)

Note: this report is the first part of the Secretary's report to the CIPM, presented at Session I of the 103rd meeting of the CIPM in March 2014.

#### 1. Meetings of the bureau of the CIPM (the “bureau”)

Since the last meeting of the CIPM on 22 and 25 October 2013, the bureau met on 25 October 2013 and on 8-10 March 2014 at the Pavillon de Breteuil.

During the period October 2013 through March 2014 the Secretary made a number of additional visits to the BIPM, among others for chairing the CIPM Sub-Committee on the Pension Fund and Health Insurance on 15 November 2013 and on 7 March 2014.

On 15 November 2013 Mr Énard and the Secretary assisted at the opening of the caveau, facilitating the BIPM to start the comparisons of the 1 kg mass witness standards with the IPK in the scope of the planned programme of weighings ahead of the proposed re-definition.

On 4-6 December 2013 the Secretary attended the JCTLM stakeholders and Executive Committee meetings.

On 12 December 2013 the Secretary met with the Director of the BIPM to discuss the measures to be taken during the Director's period of absence for medical treatment.

During this period of absence, the Secretary chaired the monthly BIPM Management Team meetings on 9 January 2014, 11 February 2014 and 4 March 2014.

Over the whole period the President and Secretary of the CIPM have been and will remain in regular contact with the BIPM Director.

#### 2. CIPM Membership

Following the proposed new rules of procedure for the election of new CIPM members, and after consultation with the *ad hoc* Working Group on the Role, Mission, Objectives, Long-term Strategy and Governance of the BIPM (AHWG), Dr Kang was elected as a new member of the CIPM with effect from 1 January 2014.

#### 3. Member States of the BIPM (Member States) and Associates of the CGPM (Associates)

With retrospective effect to 20 August 2013, the Republic of Iraq has acceded to the Metre Convention, bringing the number of Member States to 56.

On 29 January 2014 the Grand Duchy of Luxembourg signed up as an Associate to the CGPM, bringing the number of Associates to 39.

With reference to the Resolution 4 “On the status of Associate State of the General Conference”, adopted by the 24th meeting of the CGPM (2011), almost none of the 14 Associates for which it would be appropriate to become Member States have so far indicated their intention to do so in the near future. However, the Philippines’ NMI has been in dialogue with the BIPM for information to support the internal proposal to their Ministry to support such a transition, and the NMI from Latvia has been in dialogue with the BIPM while making a case to its Ministry to avoid withdrawing from participation in the activities of the BIPM.

The BIPM will continue to monitor whether these Associates are paying their increased contributions.

The CIPM will be requested to instruct the BIPM to formally write to the Philippines, an Associate since 2002, which had its first CMCs published in the KCDB in December 2013.

#### **4. Member States and Associates in financial arrears for more than three years**

Currently none of the Member States and Associates have arrears for more than three years.

The BIPM will continue to monitor the timely payment of the dotation by those Member States with which a rescheduling agreement has been signed. However, as the Member States concerned have currently not yet paid the agreed amounts in euros for the year 2013, the advantages and prerogatives conferred by accession to the Metre Convention have been suspended.

Overall, the payment of the required dotation and contribution by the Member States and Associates follows the yearly pattern expected.

#### **5. Preparations for the 25th meeting of the CGPM**

Implementation of all the recommendations made by the AHWG has now been (or is being) addressed. As a consequence several working procedures have been adapted. In particular the method of communication and information transfer has been modified leading to much better interaction and consultation with the NMI Directors and Government Representatives.

Results of the consultation with the NMI Directors and State Representatives concerning the mid- and long-term strategy have been implemented, and in preparation for the 25th CGPM meeting in November 2014, an extensive scheme of regular and timely consultation will be applied. This will be used in the development of the proposed BIPM Work Programme for the period 2016-2019, the proposed Resolutions and the election of members of the CIPM.

The President of the French *Académie des Sciences* has been invited to chair the 25th CGPM meeting, to be held on 18-20 November 2014 in Versailles, France.



## 6. CIPM Sub-Committees and CIPM *ad hoc* Working Groups

The CIPM Sub-Committees for Strategy, Finance, Pension and Provident Fund and Health Insurance, and the *ad hoc* Working Groups on CIPM Membership, and Conditions of Employment, have continued their activities and will report on their meetings, findings and achievements later in the agenda of this meeting.

The *ad hoc* Working Group on CIPM Membership has prepared draft documents formulating requirements for the election of Consultative Committee Presidents, and giving guidance for the election of CC Working Group Chairpersons and Deputy Chairpersons.

## 7. Presidency of Consultative Committees (CCs) and Consultative Committee Presidents meeting

Prof. Mills resigned as President of the CCU with effect from 1 January 2014 and Prof. Ullrich, President of the PTB, has been appointed as his successor.

The first joint Consultative Committee Presidents meeting was held at the BIPM on 11 March 2014. This meeting was also attended by all Consultative Committee Executive Secretaries. The aim of this joint CC Presidents meeting was to discuss and improve the efficiency of the CCs in serving the metrological needs of the Member States, improving mutual cooperation, harmonizing working processes, developing joint strategies, identifying gaps and improving the cooperation with all relevant international stakeholder organizations. A report on the outcome of the meeting will be presented later in the agenda.

## 8. The CIPM MRA

On 23 October 2013 the Mongolian Agency for Standardization and Metrology (MASM), Mongolia, signed the CIPM MRA, bringing the number of signatories to 93 institutes from 52 Member States, 37 Associates and 4 international organizations, and covering a further 150 institutes designated by the signatory bodies.

It is expected that the number of signatories of the CIPM MRA will increase further in the near future.

The next meeting of the JCRB will take place on 26-27 March 2014 at the BIPM.

## 9. Relations with other bodies

9.1. The annual bilateral meeting of the BIPM and the ILAC and the quadripartite meeting of the BIPM, ILAC, ISO and the OIML took place at the BIPM on 5 and 6 March 2014. A report will be presented later in the agenda.

9.2. The CIPM bureau met with the VAMAS leadership on 10 March 2014 to discuss the possible strengthening of cooperation in the field of materials metrology. A report will be given later in this meeting.

- 9.3. On 4-5 December 2013 a very successful JCTLM member and stakeholder meeting was held at the BIPM, followed by the annual meeting of the JCTLM Executive. In particular, both meetings addressed the successful contributions of the JCTLM to realizing traceability in clinical chemistry, but also discussed how the still very large areas of clinical chemistry where we have not yet been able to establish sustainable traceability, can be addressed. The JCTLM also discussed the costs of the JCTLM secretariat and the JCTLM database at the BIPM. The JCTLM Executive has initiated a study on the desirability and possibilities of involving more international organizations in the JCTLM with an interest in reliable and traceable measurements in clinical chemistry and laboratory medicine, as well as how a more sustainable basis for financing the operations of the JCTLM can be achieved. This point will be further addressed later in the agenda.

## 10. BIPM administrative and staff matters

- 10.1. The BIPM commissioned Mercer [an international actuary company] to produce an additional report concerning the investment policy of the Pension and Provident Fund and Health Insurance assets. The report has been delivered and was discussed in November 2013. Following this discussion and consideration of the report, the BIPM has discussed an investment policy with the HSBC, which is expected to be signed soon.

Mercer was commissioned to carry out another study for the delivery of information on a number of different scenarios for the BIPM Pension and Provident Fund. On the basis of this study further decisions can be made with respect to the optimum long-term sustainable pension scheme for the BIPM staff.

A study of the BIPM Health Insurance and its liabilities has been initiated.

A report will be given later in the agenda.

- 10.2. The Chairman of the CIPM Sub-Committee on Finance, Dr Bowsher, met with the head of the Finance, Budget and Procurement Office at the BIPM in February 2014 and the CIPM Sub-Committee on Finance met at the BIPM on 10 March 2014.

A report will be presented later in the agenda.

- 10.3. The BIPM has commissioned a comparison study with respect to conditions of employment to the International Service for Remunerations and Pensions (SIRP). The report of this study is expected in mid-2014 and will be discussed by the CIPM *ad hoc* Working Group on Conditions of Employment.

- 10.4. The BIPM has prepared a new BIPM Policy on Soliciting and Accepting Support from Third Parties for approval by the CIPM. This will be discussed later in the agenda.

- 10.5. At the request of members of the *ad hoc* Working Group on CIPM Membership the CIPM has been asked to draft a procedure for the election of a CIPM “CGPM” Committee for Election of CIPM Members, a role currently, during the transitional period, fulfilled by the AHWG.

## 11. Communication

As part of improving the visibility of the BIPM as a lean, flexible and up-to-date leader in defining and realizing a credible and reliable global measurement system, a new logo and presentation format has been designed. This will be presented later in the agenda.

**Appendix 2** – CIPM President's letter in response to Norwegian concerns on the 'Criteria and process for election of CIPM members' document.

This is to respond to your suggestions regarding the process to be used for selection of CIPM members at the 25th Meeting of the CGPM. That process, approved by the CIPM in October 2013, is described in Document 'Criteria and Process for Election of CIPM Members' on the BIPM Website at <http://www.bipm.org/utis/en/pdf/cipm-election-process.pdf>

Your concern was discussed in October 2013 prior to final approval of the process and again at the March 2014 meeting of the CIPM. The unanimous decision was to honour the process that the CIPM approved in October 2013 and provided to NMI Directors and Government Representatives in January 2014 in the call of nominations for candidates for the elections at the upcoming 25th Meeting of the CGPM.

The CIPM did agree, however, to consider incorporation of your suggested modification to the process (along with others that might come forward) if such is warranted after we have exercised this new process for the first time at the upcoming CGPM.

Thank you again for your suggestion. Going forward, the CIPM is committed to implementing a process for electing members that is fair, transparent, and effective in selecting the best team of 18 members to carry out the responsibilities entrusted to the CIPM by the CGPM.

Sincerely

Barry Inglis  
President, CIPM



**International Committee  
for Weights and Measures**

**Proceedings of Session II**

**of the 103rd meeting**

**(13-14 November 2014)**

## **Executive Summary**

### **Session II of the 103rd meeting of the CIPM (13-14 November 2014)**

#### **CODATA deadline**

The CIPM supported the CODATA proposal to set a deadline of 1 July 2017 for submission of experimental data to be used by the CODATA TGFC in the evaluation of the fundamental constants which will lead to the fixed values for the defining constants of the new SI.

#### **Phase II of the extraordinary calibration campaign**

The CIPM supported the BIPM in progressing to Phase II of the extraordinary calibration campaign using the IPK and in disseminating corrected values for calibrations performed with respect to the BIPM mass unit.

#### **CGPM attendance policy**

The CIPM endorsed the proposed CGPM attendance policy.

#### **Rescheduling agreement with the Islamic Republic of Iran**

The CIPM noted that the BIPM was informed of two bank transfers being processed from the National Standards Organization of Iran for the settlement of the total sums due for 2013 and 2014.

In order to allow the CGPM to duly address the position with the Islamic Republic of Iran at its 26th meeting, the CIPM and the Islamic Republic of Iran decided to freeze the effects of the Rescheduling Agreement made in 2012 through a new agreement that *inter alia* requires continuity in payment of the Member State contribution by the Islamic Republic of Iran in the year it is due.

#### **The Big G consortium**

The CIPM agreed to establish a consortium of NMIs and other institutes, coordinated by the NIST, to facilitate new work to resolve the present disagreement amongst measurements of the Newtonian constant of gravitation,  $G$ .

## MEMBERS OF THE INTERNATIONAL COMMITTEE FOR WEIGHTS AND MEASURES

As of 13 November 2014

### President

B. Inglis, National Measurement Institute (NMIA), Lindfield, Australia.

### Secretary

R. Kaarls, Zoeterwoude, the Netherlands.

### Members

B.R. Bowsher, National Physical Laboratory (NPL), Teddington, United Kingdom.

H.S. Brandi, *Instituto Nacional de Metrologia, Qualidade e Tecnologia* (INMETRO), Rio de Janeiro, Brazil.

K. Carneiro, Holte, Denmark.

Y. Duan, National Institute of Metrology (NIM), Beijing, China.

L. Énard, *Laboratoire National de Métrologie et d'Essais* (LNE), Paris, France.

D.-I. Kang, Korea Research Institute of Standards and Science (KRISS), Daejeon, Republic of Korea.

V.N. Krutikov, *Rosstandart*, Moscow, Russian Federation.

W. Louw, National Metrology Institute of South Africa (NMISA), Pretoria, South Africa.

W.E. May, National Institute of Standards and Technology (NIST), Gaithersburg, United States of America. *CIPM Vice-President*.

J.W. McLaren, Ottawa, Canada. *CIPM Vice-President*.

H.O. Nava-Jaimes, *Centro Nacional de Metrología* (CENAM), Querétaro, Mexico.

A. Sacconi, *Istituto Nazionale di Ricerca Metrologica* (INRIM), Turin, Italy.

H. Uğur, Mugla, Turkey.

J. Ullrich, *Physikalisch-Technische Bundesanstalt* (PTB), Braunschweig, Germany.

T. Usuda, National Metrology Institute of Japan (NMIJ/AIST), Tsukuba, Japan.

J. Valdés, *Instituto Nacional de Tecnología Industrial* (INTI), Buenos Aires, Argentina.

**Honorary members**

E. Ambler, Hilton Head Island, United States of America.

W.R. Blevin, Glenhaven, Australia.

L.M. Branscomb, La Jolla, United States of America.

J.V. Dunworth, Ramsey, Isle of Man, United Kingdom.

E.O. Göbel, Braunschweig, Germany.

K. Iizuka, Tokyo, Japan.

D. Kind, Braunschweig, Germany.

J. Kovalevsky, Grasse, France.

J. Skákala, Bratislava, Slovakia.



## Agenda

1. Opening of the session, quorum and approval of the agenda
2. Confirmation of the minutes of Session I (12-13 March 2014) and list of decisions
3. Report of the Secretary and activities of the Bureau of the CIPM, including an update on new and prospective Members and Associates
4. Update on the activities of the BIPM by the Director
5. Financial matters
6. Results of the extraordinary campaign of measurements with the IPK
7. Report from the President of the CCM
8. Report from the BIPM Mass Department
9. Report from the President of the CCU
10. Update on plans for the 25th CGPM meeting
11. The long-term strategy of the BIPM
12. Review of proposals for the BIPM Work Programme and a BIPM Visitor Programme
13. Report from the Chair of the CIPM Sub-Committee on the BIPM Pension and Provident Fund and Health Insurance
14. Report from the Chair of the CIPM *ad hoc* Working Group on BIPM Conditions of Employment
15. Review of proposed scenarios for the BIPM dotation 2016-2019
16. Review of the actions carried out to prepare for the CIPM election
17. The proposal for a CGPM 'Committee for CIPM Election'
18. Succession planning for CIPM leadership
19. Review of the major points likely to arise in discussion of CGPM Resolutions
20. Convocation for the 26th CGPM meeting
21. Report from the BIPM Electricity Department and the CCPR
22. Report from the BIPM Chemistry Department, the CCQM and the JCTLM
23. Report from the BIPM Ionizing Radiation Department, the CCRI, the CCAUV and the CCT
24. Report from the BIPM Time Department, the CCTF and the CCL
25. Proposed changes to CC members and observers
26. Presentation by the delegation from the Islamic Republic of Iran
27. Review of the issues raised by the delegation from the Islamic Republic of Iran (in camera)
28. Report on coordination and liaison
29. Report from the JCRB including steps towards the review of the CIPM MRA
30. CIPM position on revisions of ISO/IEC 17025 and ISO Guide 34
31. Report from the JCGM

32. Future BIPM workshops and meetings
33. Proposed revisions to the BIPM Rules and Regulations (RRI)
34. The Big *G* consortium
35. Any other business
36. Close of meeting

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

The International Committee for Weights and Measures (CIPM) held Session II of its 103rd meeting on Thursday 13 and Friday 14 November 2014 at the International Bureau of Weights and Measures (BIPM).

Present: B.R. Bowsher, H.S. Brandi, K. Carneiro, Y. Duan, L. Énard, B. Inglis, R. Kaarls, D.-I. Kang, V. Krutikov, W. Louw, W.E. May, J.W. McLaren, M.J.T. Milton (Director of the BIPM), H.O. Nava-Jaimes, A. Sacconi, H. Uğur, J. Ullrich, T. Usuda and J. Valdés.

Also attending the meeting were: C. Fellag Ariouet (Personal Assistant to the Director and head of the Secretariat and Housekeeping Office), C. Planche (Librarian/Drafting Officer) and R. Sitton (Publications Officer).

The following were in attendance for parts of the meeting: I. Andernack (head of the BIPM Finance, Budget and Procurement Office), E.F. Arias (Director of the Time Department and Executive Secretary of the CCTF), S. Arlen (head of the BIPM Legal, Administration and Human Resources Office), H. Fang (Mass Department), A. Henson (Director of the International Liaison and Communication Department), J.-M. Los Arcos (Director of the Ionizing Radiation Department and Executive Secretary of the CCRI), E. de Mirandés (Mass Department), S. Picard (Executive Secretary of the CCAUV and acting interim Executive Secretary of the CCT), T.J. Quinn (Emeritus Director), P. Richard (President of the CCM), L. Robertsson (Executive Secretary of the CCL), M. Stock (Director of the Electricity Department, interim Director of the Mass Department and Executive Secretary of the CCEM and CCPR), C. Thomas (Executive Secretary of the CCU) and R. Wielgosz (Director of the Chemistry Department and Executive Secretary of the CCQM).

Dr Inglis, President of the CIPM, opened the session. With all 18 members present the quorum was satisfied according to Article 12 of the Regulations annexed to the Metre Convention. He asked for any comments on the agenda.

Dr Sacconi asked why the issues on terminology raised by Dr Quinn at Session I in March 2014 were not on the agenda. It was noted that this will be discussed in §2 under Decision CIPM/103-22.

Dr Milton commented that an Iranian delegation has been invited to give a presentation to the CIPM (see §26-27).

The agenda was approved.

## 2. **CONFIRMATION OF THE MINUTES OF SESSION I (12-13 MARCH 2014) AND LIST OF DECISIONS**

The minutes of Session I of the 103rd meeting (2014), as approved by correspondence, were accepted as a true record.

The President reviewed the decisions from Session I. The status of the following points was noted:

**Decision CIPM/103-10** *The CIPM charged the Working Group on CIPM Membership to come forward with proposed criteria and selection process of CC Presidents and good practices for the appointment of CC Working Group Chairpersons and Deputies, to be integrated into document CIPM-D-01, for approval by the CIPM at its November 2014 meeting. A proposal made by Dr Richard to include a section in the document to cover the creation of new CC Working Groups and the closure, merger and confirmation of active Working Groups will be further considered by the Working Group on CIPM Membership and the CIPM.*

Work on this decision is in progress.

**Decision CIPM/103-11** *The CIPM supported the proposed BIPM Work Programme for the years 2016 to 2019 as a basis for the final document and charged the Director of the BIPM and Mr Henson to take the CIPM members comments into account.*

*The CIPM decided that the Work Programme would be opened online to Member States for comments and the consultation be brought to the attention of the Directors of National Metrology Institutes and Designated Institutes.*

*The CIPM decided that the alternative Time activity “T-A3.3 Frequency comb validation” in the proposed BIPM Work Programme would remain an optional project. The CIPM requested the Director of the BIPM to review the costs and scope of the project. Optical frequency combs for the realization of the length unit are, and will become, even more important and decisive tools. The absence of a formal validation programme for those measurement systems at the heart of the realization of the SI base unit must be seen as unsatisfactory and deserves closer consideration of the CIPM and BIPM in the BIPM Work Programme.*

*The CIPM requested that consideration be given to including the alternative Chemistry activity “A2.1.4 Small Molecule Organic Primary Reference Comparisons (Pure Materials)” in the Work Programme.*

Dr Milton commented that the alternative activities have been rejected as there was no consensus to fund them.

**Decision CIPM/103-15** *The CIPM approved the proposed text with the agreed changes for the five Draft Resolutions to be submitted to the General Conference on Weights and Measures (CGPM) at its 25th meeting (2014). The CIPM charged the Director of the BIPM, Mr Henson and Dr Wielgosz to come forward with a Draft Resolution on the impact of metrology.*

The CIPM bureau had discussed several Draft Resolutions on the impact of metrology but would not propose one for further discussion. It was decided that a message on the impact of metrology and its importance is needed, but this may best take some form other than a Draft Resolution to the CGPM. Dr Bowsher informed the CIPM that a study on the economic impact of metrology had been commissioned by the UK government and endorsed by the UK Treasury. He offered to share the study as some of the more generic comments may be of use to other nations. A headline figure from the study is that for every £1 spent on metrology, the return is £50; this makes an excellent case for the benefits and impact of metrology.

**Decision CIPM/103-22** *The CIPM charged Ms Arlen and Dr Quinn to prepare notes on terminology to be forwarded to the CIPM and to be considered by the bureau at its meeting in June 2014. The CIPM bureau will prepare a recommendation to be submitted to the CIPM in November 2014.*

The CIPM bureau received the notes from Ms Arlen and Dr Quinn and has prepared a recommendation. However, the notes had not been forwarded again to the CIPM. The notes will be circulated to the CIPM and will be discussed, along with the recommendation, in March 2015.

There were no further comments on the Decisions from Session I.

**Decision CIPM/103-24** The CIPM accepted the minutes of Session I of the 103rd meeting of the CIPM as a true record.

**Decision CIPM/103-25** The CIPM decided to defer action on CIPM/103-22 until the meeting of the CIPM in March 2015. The BIPM will circulate notes on terminology, prepared by Ms Arlen and Dr Quinn, to the CIPM members.

### 3. **REPORT OF THE SECRETARY AND ACTIVITIES OF THE BUREAU OF THE CIPM, INCLUDING AN UPDATE ON NEW AND PROSPECTIVE MEMBERS AND ASSOCIATES**

Dr Kaarls, Secretary of the CIPM, gave his report (see Appendix 1). He highlighted the fact that the Republic of Estonia, Georgia, the Republic of Paraguay and the Republic of Peru (which became Associates on 27 January 2005, 1 January 2008, 6 May 2009 and 28 May 2009 respectively) have met the criteria to be encouraged to become States Parties to the Metre Convention. The CIPM decided to proceed with encouraging these Associates to become Member States.

**Decision CIPM/103-26** The CIPM decided, on the basis of the criteria it has previously adopted, that it would be appropriate for the Republic of Estonia, Georgia, the Republic of Paraguay and the Republic of Peru to become States Parties to the Metre Convention. The BIPM will convey the Decision, recalling Resolution 4 ‘On the status of Associate State of the General Conference’ adopted by the CGPM at its 24th meeting, and the implications regarding the increase in subscriptions should any of the States choose to remain as an Associate of the CGPM.

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

The Director reported that the period March 2014 to November 2014 has been very busy, particularly with the preparations for the CGPM. In this respect, two major initiatives were developed during the summer: both the proposal for a Visitor Programme and the long-term strategy for the BIPM. The proposed Visitor Programme was developed as a result of discussions with Member States. These initiatives will be discussed later in the agenda.

#### **Staff**

There have been several engagements with the BIPM *Commission des conditions d’emploi* (CCE) since Session I in March 2014. This interaction has allowed the Director to maintain good communications with staff while the sustainability of the BIPM pension scheme was discussed by the CIPM in advance of the CGPM.

The Director held a meeting with a group of three BIPM pensioners who are planning to set up an association for retired BIPM staff. The initiative has been welcomed and they have been encouraged to proceed.

A particular point of discussion with the staff has concerned their participation in the CGPM. The Director, following discussions with representatives of Member States, and with the support of the CIPM President and bureau, has developed a draft policy for attendance at the CGPM that is in keeping with the requests by the Member States.

The Director was reminded during discussions with Member States that it is expected that all international organizations should have procedures in place for ‘whistleblowing’, and in particular to ensure that any staff who carry out whistleblowing should be free from any retribution. There is not thought to be any problem with this at the BIPM, and it underlies the principles in our code of conduct. To ensure that everyone is clear about this, the Director consulted the CCE and sent a note to staff reminding them that such protection is already in place.

Dr Douglas Olson, NIST, USA, has been appointed as the Executive Secretary of the Joint Committee of the Regional Metrology Organizations and the BIPM (JCRB) from January 2015 for a 2-year secondment. Dr Olson will succeed Mr Kuanbayev, KazInMetr, Republic of Kazakhstan, who was thanked by the Director for his excellent service over the last two years. Retirements in 2015 will include Dr Thomas, KCDB Coordinator and Executive Secretary of the Consultative Committee for Units (CCU).

### **Finance**

The process of completing the annual audit and financial statements is always complex and in 2014 there has been significant additional pressure from the need to prepare detailed costings for the proposed 2016-2019 Work Programme. Despite this, the accounts were completed on time. The accounts were ‘signed-off’ by correspondence for the first time with the support of the CIPM Sub-Committee on Finance and its Chairman, Dr Bowsher. This arrangement worked very satisfactorily and it is hoped that the same approach will continue in the future. It will also eliminate the need to hold a CIPM meeting to approve the accounts and will give more flexibility over the date of the meeting. The 2014 audit marked the first time that an unqualified audit report was received.

The Director noted that quietus was required from the CIPM for the audited financial statements of the BIPM and for the BIPM Pension and Provident Fund for 2013 (see Decision CIPM/103-27).

### **Buildings, quality and safety**

The previously reported (Session II of the 102nd meeting and Session I of the 103rd meeting) problems with electricity consumption were resolved in December 2013. A new electricity meter has been installed and further investigations have found that the problem started in the first quarter of 2012. EDF, the BIPM’s electricity supplier, has been approached for a refund.

Recently completed building work includes the new laboratory for the NMR facility and refurbishment of the offices in the Pavillon de Breteuil for the Mass Department. The reconfiguration and refurbishment of the offices in Level –2 of the Nouveau Pavillon is complete and this new suite of offices now houses the staff of the Director’s Office. Other recent building work included the installation of new fences around the perimeter of the site.

The project to redesign the offices and corridor in the Observatoire will start in 2015. This project will include modernization of the heating system. Rationalization of the Marie Curie Building will also start in 2015.

Mr Maggi, the Quality, Health and Safety Manager, presented the BIPM Quality Management System (QMS) to the EURAMET TC-Q in April 2014.

## Collaboration and visits

The collaboration with JEOL, Japan, for the new NMR facility in the Chemistry Department has been carried out through the NMIJ, Japan. BIPM staff received training on the use of the NMR facility during secondments to the NMIJ, Japan, and the NRC, Canada. The BIPM is also collaborating with the KRISS, Republic of Korea, in the area of gas chromatography.

The BIPM is grateful for the support it has received through these collaborations and secondments.

A letter has been received from the Commission for Instruments and Methods of Observations of the World Meteorological Organization (WMO CIMO) seeking a formal liaison with the Consultative Committee for Thermometry (CCT).

Neil deGrasse Tyson, head of the Hayden Planetarium, USA, and an eminent science promoter, visited the BIPM on 10 July 2014.

The President thanked Dr Milton for his report and invited questions and comments.

Dr Quinn welcomed the discussions with the group of BIPM pensioners and the plans to set up an association for retired BIPM staff. Dr Kaarls, in his capacity as Chairman of the CIPM Sub-Committee on the BIPM Pension and Provident Fund and Health Insurance, noted that he is aware of the plans.

The President recalled that the Director had requested quietus for the audited financial statements of the BIPM and of the BIPM Pension and Provident Fund for 2013. The process of approving the statements had been carried out by correspondence (as agreed at Session I) and final unanimous support had been received on 14 June 2014. He asked the CIPM to give quietus to the Director.

**Decision CIPM/103-27** The CIPM confirmed its approval of the audited financial statements of the BIPM and of the BIPM Pension and Provident Fund which it has approved by correspondence in June 2014. The CIPM gave the BIPM Director quietus for the 2013 exercise.

## 5. FINANCIAL MATTERS

Ms Andernack, head of the Finance, Budget and Procurement Office, joined the meeting and presented a summary of the proposed budget for 2015. Total revenue shown in the outturn at 31 October 2014 was at 102 % of the 2014 budget (13 082 k€ compared to 12 885 k€). The extra revenue was due to new Associates which increased subscriptions to 702 k€ compared to the 2014 budget of 570 k€. This helped to compensate for the low return on investments. A small surplus is expected in 2014.

Expenses at 31 October 2014 were in line with the 2014 budget. Operating expenses were less than the budgeted figure with expenditure on electricity well below budget following the resolution of problems with the electricity meter, as reported in §4. Laboratory capital expenditure for 2014 is expected to be around 100 k€ less than the budgeted figure following a reappraisal of some investment projects and others being postponed. Operating expenditure for building projects is in line with most of the budget. The priority for capital expenditure on buildings has changed during 2014, with some of the Observatoire refurbishment project moving into 2015.

The proposed 2015 budget includes two new lines: “Depreciation and amortization” and “Change on provision for healthcare”. These lines were added to align the budget with the principles of accrual accounting.

The President thanked Ms Andernack for her report and invited questions and comments. He reminded the CIPM that approval is required for the 2015 budget.

There was a brief discussion to clarify a few points on the presentation of the budget. It was suggested that full accrual balance sheets could be presented. This would require new accounting software, an option which is being investigated in 2015. The Chairman of the CIPM Standing Sub-Committee on Finance, Dr Bowsher, commented that for the future process, the Sub-Committee should have the opportunity to see the data before it is presented to the CIPM so that they can consider it prior to it being recommended for approval. He further commented that the summary represents a clear way forward and is very logical, and on behalf of the committee he recommended the 2015 budget. The proposed budget for 2015 was approved unanimously.

**Decision CIPM/103-28** The CIPM approved the budget proposed for 2015.

The President welcomed Dr Davis, Dr Fang, Dr de Mirandés, Dr Richard, Dr Stock and Dr Thomas to the meeting for the presentations and discussion in §6-8.

## 6. RESULTS OF THE EXTRAORDINARY CAMPAIGN OF MEASUREMENTS WITH THE IPK

Dr Stock explained the motivation for the extraordinary calibrations and gave a summary of the results so far. The objective is to provide improved traceability to the IPK for those National Metrology Institutes (NMIs) that are measuring the Planck constant,  $h$ . The campaign is being carried out in two phases. Phase I consists of cleaning and washing the IPK and its six official copies and recalibration of the six official copies against the IPK. Finally, it involves the recalibration of the BIPM working standards against the IPK, which was last carried out during the 3rd Periodic Verification (PV) in 1992. Phase II will involve calibration of the NMI standards with respect to two BIPM working standards linked to the IPK during Phase I.

The results of Phase I answer three questions:

1. How much material is removed from the IPK during cleaning and washing? The IPK and the six official copies behaved consistently. The mass loss from the IPK was 17 µg, the average mass loss from the official copies was 15 µg with a standard deviation of 2 µg. The mass loss from the IPK was smaller than expected from the results of the 3rd PV.
2. Is the mass drift of the official copies with respect to the IPK continuing? No, the mass differences remained stable within 1 µg, indicating that the IPK and the six official copies are now behaving as a consistent set of mass standards.
3. Following the recalibration of the working standards, are the masses of the BIPM working standards, with respect to the IPK, as expected? No, the “as-maintained” BIPM mass unit was last linked to the IPK in 1992. In 2014 it was found to be 35 µg different from the mass of the IPK.

$$m(X)_{\text{BIPM}} - m(X)_{\text{IPK}} = 35 \text{ µg}$$

$$m(\text{IPK})_{\text{BIPM}} = 1 \text{ kg} + 35 \text{ µg}$$

All BIPM working standards appear to have lost mass with respect to the IPK since the 3rd PV of between 18 µg and 88 µg (supposing that the IPK has been stable). The relative drift between the working standards had been noticed by the BIPM, but not the common drift because the IPK was not



available to be used as a reference. The undetected common drift has led to an offset of the BIPM mass unit. Examination of the data shows that the standards that have been used most frequently show the greatest mass losses. The hypothesis that the losses are due to wear during the measurements is being analysed.

Phase II of the campaign is now under way.

Dr Stock added that the Mass Department had been encouraged to investigate whether the IPK had been cleaned effectively during the measurements. Contamination remaining on the surface of the IPK after cleaning could explain the observed offset. This hypothesis was tested by a different operator who cleaned and washed two official copies (K1 and No 7). The conclusion from these tests was that limitations in the repeatability of the cleaning and washing did not explain the observed offset.

Dr Stock's second presentation gave an overview of the traceability of the BIPM "as-maintained" mass unit. In summary, since 1992 it has been maintained using a set of working standards, since the IPK was not available. In total 20 mass comparisons of the working standards were carried out between the 3rd PV and the extraordinary calibrations. Dr Stock had reviewed all of the laboratory records over the period and showed a chart that summarized how traceability was maintained.

Dr de Mirandés presented her work on the analysis of the BIPM mass comparison data since the 3rd PV. Different models for mass evolution have been tested. They include assumptions about a linear mass drift and a wear effect that depends on each mass comparator and on each mass standard. The best model seems to indicate that a wear effect on one of the mass comparators could have started in 2004. This would coincide with some modifications known to have been carried out. These models associate the effect of excess wear mainly with a comparator that was taken out of service in 2010. The IPK and its copies have never been weighed using it.

The President thanked Dr Stock and Dr de Mirandés and invited questions.

Prof. Valdés commented that during the Workshop on the *Mise en Pratique* in 2012, the drift of some of the mass prototypes was reported, even with the limited information available at the time. He asked how the uncertainties were justified. Dr Stock stated that during comparisons it was noticed that the working standards changed and assumptions were made as to which prototypes were the most stable, while others were recalibrated. There was confidence at the time that the process would be sufficiently well understood that a calibration uncertainty of 7  $\mu\text{g}$  could be justified. He commented that the full information was not available at the time.

The President noted that the CIPM should take a decision as to how the corrected values for calibrations performed with respect to the BIPM "as-maintained" mass unit should be disseminated. Dr Carneiro questioned how such a complex correction should be disseminated retrospectively. Dr Richard agreed that this issue needs to be resolved and noted that something will need to be proposed at the next meeting of the CCM in February 2015. The NMIs will need to be given guidance on how to deal with the correction. The Director said that this is a complex problem that needs to be kept in context. He stated that some laboratories will be affected but the correction will not result in every NMI having to change its mass scale. The BIPM is taking the situation very seriously because some laboratories will be affected and there are concerns about the influence on determinations of  $h$ . He noted that the problems largely relate to the period between 2000 and 2010. Most of the published data on the Planck constant is based on traceability after 2010 which can now be corrected with reasonable confidence.

An outcome of the investigations is that a significant amount of carefully analysed data on how the mass standards have performed over the last 20 years is now available. This will form the basis of a thorough statistical model of how the standards should be maintained in the future. This will give the Mass Department clear guidance on the implementation of a hierarchical approach, including the role of the IPK.

The CCM Support Group which had been organized at the request of the Director to assist the BIPM in managing the extraordinary calibrations, reached a broad consensus that the BIPM should proceed to distribute corrected values based on the best available model. They took that view even though the solution was not perfect, recognizing that the uncertainties were unlikely to improve by a significant amount over the coming months. Also, the deadline for submission of data to CODATA is 31 December 2014 and some laboratories may want to submit a corrigendum based on this data. The CCM Support Group agreed that the BIPM should go ahead and distribute the values and uncertainties to those NMIs involved. This effectively closes Phase I and marks the start of Phase II of the extraordinary calibration campaign. The Director asked for the CIPM's endorsement to proceed on this basis and the CIPM gave their support.

**Decision CIPM/103-31** The CIPM supported the BIPM in progressing to Phase II of the extraordinary calibration campaign using the international prototype of the kilogram and in disseminating corrected values for calibrations performed with respect to the BIPM mass unit. The BIPM will determine the associated uncertainties in collaboration with the CCM support group.

## 7. REPORT FROM THE PRESIDENT OF THE CCM

Dr Richard gave a report on the activities of the Consultative Committee for Mass and Related Quantities (CCM). His report focused on the transition to a new definition of the kilogram, particularly the CCM roadmap towards the redefinition and the use of the IPK. All the work according to the roadmap is on track. He mentioned the streamlining of the CCM to provide a much simplified working group structure; the number of working groups has been reduced from 14 to nine over two years. As part of this streamlining exercise, Dr Richard presented the CCM's decision to create merged working groups for density and viscosity and for pressure and vacuum. The merged groups have combined and simplified terms of reference. He asked for the CIPM's backing for the two mergers which was duly given.

**Decision CIPM/103-29** The CIPM noted the decision of the Consultative Committee for Mass and Related Quantities (CCM) to merge its Working Groups for Pressure and Vacuum and its Working Groups for Density and Viscosity.

The President thanked Dr Richard and invited questions and comments. Prof. Uğur commented that there is an apparent shift away from the use of fundamental physics to explain the ageing behaviour of the mass prototypes. He recommended carrying out active experimentation to study the ageing effects on one of the mass prototypes. This view received some support, particularly in view of advances in surface analysis such as X-ray photoelectron spectroscopy (XPS) and in the understanding of cleaning processes.

## 8. REPORT FROM THE BIPM MASS DEPARTMENT

Dr Stock gave a report on the activities of the BIPM Mass Department. Two new members of staff have joined the department since Session I: Mr Damien Bautista has been recruited as a technician for carrying out volume and density calibrations since 1 July and Dr Franck Bielsa started a three-year contract as a physicist on the watt balance project on 15 July.

A brief summary of the status of mass standard calibrations, the fabrication of new prototypes and stacks, and the International Avogadro Coordination was given. In terms of the latter, weighing of the  $^{28}\text{Si}$  spheres Avo28-S5 and Avo28-S8 under vacuum, using the Sartorius CCL 1007 mass comparator, was carried out in February 2014. The IPK measurements were carried out at the same time, allowing the mass of the spheres to be given relative to the IPK with a small uncertainty. The PTB, Germany, and NMIJ, Japan, have also determined the masses. The results will be exchanged during late 2014.

Progress on the watt balance project was summarized along with the planned work through to 2018. The status of the BIPM's capability to measure  $h$  is improving and in 2013, following the transfer of the apparatus to the dedicated new laboratory, the Type A uncertainty stood at  $5 \times 10^{-7}$ , while the Type B uncertainty was  $10^{-5}$ . Improvements to the design of the apparatus were described, including the new interferometer which will avoid polarization mixing and the proposed open support structure which will allow easier access to the alignment elements. The new magnetic circuit, with an air-gap width which is uniform within  $3 \mu\text{m}$ , has been integrated into the watt balance. It is hoped that with these (and other) improvements to the apparatus, both the Type A and Type B uncertainties will be reduced to  $5 \times 10^{-8}$  by 2018.

The latest status and configuration of the ensemble of reference mass standards (ERMS) was described. The stainless steel and platinum-iridium standards are available and the PTB is etching and growing a new oxide layer on the natural silicon spheres. Work is continuing on the stacks of disks and the ERMS storage network (gas and vacuum) has recently been completed. The best combination of material and storage environment will be studied. If one combination is found to be better (or worse) than the others, the system will be adapted accordingly.

The President thanked Dr Stock for his presentation and invited questions and comments.

It was queried whether the Mass Department has sufficient resources to carry out its mission during the run up to the redefinitions. It was noted that the department is very busy, particularly with the long-term absence of the Director of the Mass Department due to health problems. The department has benefitted from the replacement of one technician and a new staff member for the watt balance project as outlined earlier. There have also been a number of secondments, particularly Dr Davidson, Head of Mass Metrology at the NPL, for two periods during 2014; further secondments are planned.

Dr Richard queried when the best value from the watt balance project will be published and whether it will contribute to fixing  $h$  in 2017 (See §9 and Decision CIPM/103-30). Dr Stock commented that the situation will be monitored but the priority for the watt balance project is to provide an instrument that can be used to realize the mass unit after the redefinition and to provide continuity.

## 9. REPORT FROM THE PRESIDENT OF THE CCU

Dr Ullrich gave a report on the activities of the CCU. Discussions at the CODATA Task Group on Fundamental Constants (TGFC) meeting on 3 November 2014 and in association with the CCM resulted in the drafting of a "Joint CCM and CCU roadmap towards the redefinition of the SI in 2018" which sets a timetable for the sequence of events leading to the redefinition. An important date to note is the closing date for the publication of new data to be considered by the CODATA-TGFC for the special adjustment of the fundamental constants. New results for inclusion in this adjustment must be accepted for publication by 1 July 2017. CODATA will supply the adjustment on 1 September 2017. A meeting of the CCU will be held in September 2017 to decide the numerical values of the defining constants, the final

version of the 9th edition of the SI brochure and the wording of the draft resolution for the CIPM ready for the 26th CGPM meeting. The CIPM meeting in October 2017 will discuss the CCU's proposals. Dr Ullrich asked if the CIPM agreed with the deadline of 1 July 2017 for the defining constants. He completed his report by presenting progress with the new logo for the SI and asked for CIPM approval to continue with the work.

The President thanked Dr Ullrich and invited questions.

It was noted that this is the first time that the deadline (1 July 2017) has been stated for the data that will contribute to the future fixed value of  $h$ . Achieving the deadline relies on the fact that all the preceding work runs according to the timetable set in the roadmap. It was confirmed that the timetable leading up to the redefinitions has not been set by the CODATA TGFC; it is working within the agenda set by the CCM, CCU and CIPM.

**Decision CIPM/103-30** The CIPM supported the proposal of CODATA to set a deadline of 1 July 2017 for submission of experimental data to be used by the CODATA Task Group on Fundamental Constants in the evaluation of the fundamental constants which will lead to the fixed values for the defining constants of the new SI.

The CIPM approved the ongoing work on the SI logo by the Consultative Committee for Units (CCU).

## 10. UPDATE ON PLANS FOR THE 25TH CGPM MEETING

The Director presented a draft of an attendance policy for the CGPM. The policy was drawn up by the CIPM bureau in response to informal feedback from representatives of several Member States following the 24th CGPM meeting.

There was a brief discussion on the policy. It was clarified that Emeritus Directors of the BIPM could attend the meeting as observers at the invitation of the CIPM. The President of the CIPM had invited two representatives of the BIPM scientific staff to attend as observers.

**Decision CIPM/103-32** The CIPM endorsed the proposed CGPM attendance policy, document CIPM/14-11.

## 11. THE LONG-TERM STRATEGY OF THE BIPM

The Director presented the draft 'BIPM Strategic Plan (2014)' document which gives details of strategic priorities for the short term (2013-2015), medium term (2016-2019) and aspirations for the long term. The document had been reviewed by the CIPM, with feedback received from ten members.

Dr Bowsher commented that it was not clear whether the document was a BIPM or a CIPM strategy and that there was too much emphasis on the technical programme and not enough on international liaison activities. It was clarified that the document is a BIPM strategy but the bureau had discussed the possibility of the CIPM developing a strategy. There was a general opinion that development of the strategy should involve engagement with a wider community, possibly through discussion at the meetings of NMI Directors and via greater participation of the regional metrology organizations (RMOs).

## 12. REVIEW OF PROPOSALS FOR THE BIPM WORK PROGRAMME AND A BIPM VISITOR PROGRAMME

The ‘Work Programme of the BIPM for the four years 2016-2019’ and ‘Proposal for a BIPM Visitor Programme 2016-2019’ which will both be presented to the CGPM were presented by the Director. The Work Programme had been the subject of a consultation exercise on the website between April to September 2014 and very few comments were received. The comments received did not support the additional projects discussed with the CIPM in March 2014 (Decision CIPM/103-11). It had been decided not to revise or reprint the document, but to submit it for adoption without the additional projects.

The proposed Visitor Programme had been drafted since the last session of the CIPM. It was developed in response to a request of the CGPM to look for new mechanisms to support states with emerging metrology systems and emerging RMOs. It was also driven by a desire to engage equitably with all of the BIPM’s Member States. The Director noted that the aim at the highest level is to strengthen the world-wide metrology infrastructure by developing the necessary human and institutional components. The programme is not intended to train experts in any particular area of metrology, instead it will provide those involved with an overview of how the global metrology system works in a particular area. The proposed Visitor Programme is complementary to the existing programme of scientific secondments to and from the BIPM. It is only aimed at Member States; it is hoped that it will provide an incentive for Associates on the “escalator” (see Resolution 4 of the CGPM (2011)) to progress to become Member States so that they can benefit from the Programme.

There was a brief discussion with strong support for the Visitor Programme, although some reservations were expressed that it may be overambitious. Mr Henson, Director of the International Liaison and Communication Department, reiterated that the Visitor Programme would have significant benefits for strengthening the emerging RMOs. As an example there are currently only four Member States of the BIPM in AFRIMETS. Any benefits that they derive from the Programme will ultimately be of benefit to all the other members of AFRIMETS.

## 13. REPORT FROM THE CHAIR OF THE CIPM SUB-COMMITTEE ON THE BIPM PENSION AND PROVIDENT FUND AND HEALTH INSURANCE

Dr Kaarls reported that the Sub-Committee had met six times since its creation and has largely focused on the governance, investment strategy and sustainability of the pension fund, with less emphasis on health insurance. The next meeting is scheduled for 20 January 2015. A number of studies, commissioned by the BIPM with Mercer [an international actuary company], have been completed and the findings were used in drafting the final report on the pension fund. The final report gives an overview of all the possibilities towards achieving a sustainable pension fund. It considers the consequences of a partial or total move to a defined contribution scheme from the existing defined benefits scheme. Moving to a defined contributions scheme would cost the fund between 41 million € and 127 million €.

The governance of the pension fund was discussed including the establishment of a supervisory board which will be operated as a CIPM Sub-Committee because responsibility for the pension fund must remain with the CIPM.

Dr Bock from METAS will present the different scenarios for the pension fund to the CGPM.

Vanbreda International, the BIPM private insurance company, gave a presentation to the Sub-Committee on the BIPM Pension and Provident Fund and Health Insurance which included an overview of the general trends in the BIPM's health insurance provision.

The President thanked Dr Kaarls and commented that the Sub-Committee has been very active.

#### 14. **REPORT FROM THE CHAIR OF THE CIPM *AD HOC* WORKING GROUP ON BIPM CONDITIONS OF EMPLOYMENT**

Dr McLaren reported on the activities of the CIPM *ad hoc* Working Group on Conditions of Employment. The International Service for Remunerations and Pensions (ISRP) delivered the 'Salary Levels Study for the BIPM' on 10 October 2014. The study was based on 34 benchmark jobs representing a wide range of positions at the BIPM. It compared remuneration packages at the BIPM with those in six other intergovernmental organizations based in Europe and at three NMIs, namely the LNE (France), the NIST (USA) and the NPL (UK). Comparing the remuneration packages at the BIPM with those of other organizations is important in understanding the ability of an organization to recruit and retain staff. It will also allow the remuneration packages at the BIPM to be optimized. The study indicated that the remuneration packages offered by the BIPM are competitive when compared to other IGOs and the NMIs mentioned.

The President thanked Dr McLaren.

#### 15. **REVIEW OF PROPOSED SCENARIOS FOR THE BIPM DOTATION 2016-2019**

The Director referred to the document 'Highlights of progress made since the 24th CGPM (2011) and Notes supporting the proposed dotation 2016-2019'. Pages 16-18 give detailed costings of three 'scenarios' to support the discussion about the dotation of the BIPM for the period 2016-2019. Scenario 3 is for no increase in the dotation, it would remain at the 2015 level. It supports the Work Programme proposed for the period in full but not the proposed Visitor Programme. The cost of inflation would be covered by making savings.

Delivering the proposed Visitor Programme in full would require a 2 % increase in the dotation. This is indicated in Scenario 1. Moving from Scenario 3 to Scenario 1 would not require any increase in the BIPM's cost base apart from the addition of one extra staff member to run the Visitor Programme. Extra money would be used solely for the support of visitors. Scenario 2 is an intermediate scenario that would only support the first activity in the Visitor Programme (to establish new opportunities for visiting staff from Member States currently developing their metrology infrastructure to work at the BIPM for periods of up to 3 months). It would not allow any new technical activities in support of the Visitors Programme.

The scenarios will be presented at the preparatory meeting on the Dotation of the BIPM which will take place on 17 November 2014.

## 16. REVIEW OF THE ACTIONS CARRIED OUT TO PREPARE FOR THE CIPM ELECTION

Dr Kaarls summarized the preparations for the election of the CIPM at the 25th CGPM meeting. He commented that it had proved very difficult to establish a large pool of candidates for the election. Candidates had come forward from several States but some did not receive the support of their respective governments. One CIPM member has had to withdraw from the election as he had not received support from his government. There are currently 23 names on the list of candidates. This list has been reviewed by the *ad hoc* Working Group on CIPM Membership which drew up a “slate” of 18 recommended candidates and this has been communicated to the Member States. Mrs Weritz, a representative of the *ad hoc* Working Group, will present the list to the CGPM. A ballot paper has been drafted which includes the slate of 18 names recommended by the *ad hoc* Working Group as well as the other five names not on the slate.

The CIPM President noted that the CIPM wished to record its appreciation for the work carried out by Dr Kaarls in preparation for the CIPM election.

## 17. THE PROPOSAL FOR A CGPM ‘COMMITTEE FOR CIPM ELECTION’

Dr Kaarls gave details of the plans for a CGPM ‘Committee for CIPM Election’ which will be elected at the forthcoming CGPM. The proposal is included in Draft Resolution B ‘On the election of the CIPM’. It is proposed that the committee will operate between meetings of the CGPM. A new Committee for CIPM Election will be elected at each CGPM. A working procedure which gives advice and guidance to the committee has been drafted. It is expected that the document will be further developed by the committee itself. It is planned that the committee will have nine members with a wide geographic distribution so that there is balanced representation from the RMOs.

## 18. SUCCESSION PLANNING FOR CIPM LEADERSHIP

The President suggested that the first item of business for the incoming CIPM in March 2015 should be to elect a new CIPM bureau (President, Secretary and Vice-Presidents). He commented that the newly elected members of the CIPM should be contacted to be made aware of the opportunities to serve on the CIPM bureau as well as being advised of the workload that it involves.

Dr Carneiro and Prof. Valdés have announced that they are stepping down as the Presidents of the Consultative Committee for Ionizing Radiation (CCRI) and Consultative Committee for Acoustics, Ultrasound and Vibration (CCAUV) respectively. The bureau had considered these vacancies and proposed the nomination of Dr Louw as the next CCRI President and Dr Usuda as the next CCAUV President. Dr May suggested that it should be made clear that these are provisional nominations that will become effective after the election of CIPM Members. This would avoid any misunderstanding that the current CIPM has made an appointment to chair a committee before the election of the new CIPM. The CIPM President commented that the CIPM has an obligation to fill these vacancies and that the nominated Presidents will certainly remain in office until the March 2015 meeting. Dr May agreed to

circulate the document ‘Guidelines for the selection of Consultative Committee Presidents’ to the CIPM.

**Decision CIPM/103-44** Dr May will circulate the document ‘Guidelines for the selection of Consultative Committee Presidents’ to the CIPM members.

The CIPM President noted that Dr Usuda will step down as President of the Consultative Committee for Photometry and Radiometry (CCPR) in March 2015 now he has been appointed as CCAUV President. Hence, a new CCPR President will be appointed at the March 2015 meeting of the CIPM. He asked the CIPM if there were any objections to the appointments of Dr Louw and Dr Usuda. There were no objections.

Dr Sacconi commented that he is not standing for election to the CIPM and as such there will be a vacancy for the President of the Consultative Committee for Length (CCL). It was decided to defer the appointment of a new CCL President until the March 2015 meeting of the CIPM as there were no meetings of the CCL before then.

**Decision CIPM/103-33** The CIPM appointed Dr Louw as next President of the Consultative Committee for Ionizing Radiation (CCRI).

**Decision CIPM/103-34** The CIPM appointed Dr Usuda as next President of the Consultative Committee for Acoustics, Ultrasound and Vibration (CCAUV).

## 19. REVIEW OF THE MAJOR POINTS LIKELY TO ARISE IN DISCUSSION OF CGPM RESOLUTIONS

Before reviewing the Draft Resolutions, the Director went through the agenda for the CGPM meeting. He noted that timings for each presentation and question/discussion session are included. There was a brief discussion on timing of the election of the Committee for CIPM Election as it was not on the agenda. The CIPM Secretary commented that it can take place after the election of the CIPM.

The Director ran through the proposed changes to the Draft Resolutions.

Draft Resolution A ‘On the future revision of the International System of Units, the SI’

Resolution 1 of the CGPM (2011) invited the CIPM to ‘continue its work towards improved formulations for the definitions of the SI base units in terms of fundamental constants, having as far as possible a more easily understandable description for users in general, consistent with scientific rigour and clarity’. There was a brief discussion on whether Draft Resolution A should include a direct reference to the consideration of ‘a more easily understandable description’. The consensus was that the wording of Draft Resolution A should not be changed. Instead, it should be made clear to the CGPM that work to keep the wording as understandable as possible is ongoing and that the CCU will discuss the issue with all interested parties.

Draft Resolution B ‘On the election of the International Committee for Weights and Measures’

In the sentence “a Committee for CIPM Election is set up in order to assist the CIPM and the CGPM in the election of CIPM members, being elected and operating in conformity with a procedure to be adopted by the CGPM” it is proposed that “to be adopted by the CGPM” is deleted. This will give the Committee for CIPM Election the flexibility to make its own decisions.

In the two references to the composition of the Committee for CIPM Election where it states that there are seven representatives of Member States, the number should be changed to nine.



A suggestion had been received to change ‘nine representatives of Member States’ to ‘nine representatives of Member States (one per Member State)’. This will be discussed at the CGPM.

#### Draft Resolution C ‘On the Pension and Provident Fund of the BIPM’

Dr Bock will be asked to clarify if there is an inconsistency in the use of the term ‘Reserve Fund’ in Draft Resolution C. It is unclear if there is a difference between the ‘BIPM Pension and Provident Fund’ and the ‘Pension and Provident Reserve Fund (PPRF)’ or if they are the same.

The invitation to the CIPM to ‘establish a Supervisory Board (SB) for the PPRF...’ has been expanded to ‘establish a Supervisory Board (SB) for the PPRF as a Sub-Committee of the CIPM...’. This makes it clear that the responsibility for the Pension Fund remains with the CIPM.

It was noted that Draft Resolution C contains an existing reference to the ‘Standing Sub-Committee on the BIPM Pension and Provident Fund and Health Insurance’. The above proposal to change the wording to ‘establish a Supervisory Board (SB) for the PPRF as a Sub-Committee of the CIPM’ may cause confusion as both seem to have similar roles. Dr Bock will be consulted for advice.

#### Draft Resolution D ‘Dotation of the BIPM for the years 2016 to 2019’

No comments.

#### Draft Resolution E ‘On the importance of the CIPM Mutual Recognition Arrangement’

The two references to a ‘sub-committee’ should be changed to ‘working group’.

## 20. CONVOCAATION FOR THE 26TH CGPM MEETING

The CIPM President recalled that it is the responsibility of the CIPM to convoke meetings of the CGPM. The period of three years between the 24th and 25th meetings of the CGPM had been difficult for the BIPM and the CIPM, particularly considering the extra work involved. The three-year mandate resulted from concerns at the last CGPM meeting relating to the governance of the BIPM and the dotation committee imposed the reduced term. These concerns have now been addressed and the bureau has proposed a return to a four-year term, which would allow the CIPM to convoke the 26th CGPM meeting in 2018.

Following a discussion, the CIPM agreed and were urged to discuss the matter with their respective governments.

The President welcomed Dr Arias, Mr Los Arcos, Dr Robertsson, Dr Stock, Dr Thomas and Dr Wielgosz to the meeting for the presentations and discussion in §21-24.

## 21. REPORT FROM THE BIPM ELECTRICITY DEPARTMENT AND THE CCPR

### BIPM Electricity Department

Dr Stock gave a report on the activities of the BIPM Electricity Department. Dr Pierre Gournay was recruited as a physicist from 1 April 2014. He replaced Mr Roland Goebel who retired on 30 April 2014.

The BIPM.EM-K10 on-site Josephson comparisons continued at a mean rate of two per year. Three comparisons are scheduled for 2015: the JV, Norway, the NIMT, Thailand, and the DMDM, Serbia. There was a significant increase in the number of BIPM.EM-K11 bilateral Zener comparisons carried out in 2014, with participants in Belgium, Egypt, Ireland, Serbia and Thailand. A Josephson Voltage Standard has been implemented in the BIPM watt balance to measure the current in the coil. Around 15 on-site quantum Hall resistance key comparisons (BIPM.EM-K12), which resumed in 2013, are expected in the coming years.

Work has continued on determining  $R_K$  with the calculable capacitor. A few problems remain to be solved and when these are fixed a preliminary measurement of  $R_K$  is expected to  $1 \times 10^{-7}$  or better. A further reduction in alignment errors should allow a measurement of  $R_K$  approaching the target relative uncertainty of  $1 \times 10^{-8}$  during the first half of 2015.

The President thanked Dr Stock and invited questions. It was queried whether the department is focusing on measurements of the von Klitzing constant now that the comparison between the watt balance and Avogadro experiments are in agreement at a level of a few parts in  $10^{-8}$ . Dr Stock stated that the von Klitzing constant is being investigated because resistance metrology works at levels of below 1 part in  $10^8$  and the best direct electrical measurement is currently 2.5 parts in  $10^8$ .

### Consultative Committee for Photometry and Radiometry (CCPR)

Dr Usuda, President of the CCPR, reported that its 22nd meeting was held on 17-18 September, preceded by meetings of its three Working Groups. The CCPR received applications for membership from the CMI, Czech Republic; observership from the CMS/ITRI, Chinese Taipei; and notice of the resignation as a member from the MKEH, Hungary (See Decision CIPM/103-35). He commented that the *mise en pratique* for the definition of the candela is in the final review stage with the CCPR before consultation with the International Commission on Illumination (CIE); final approval is expected in early 2015. The revised draft of the joint CCPR-CIE publication on principles governing photometry is expected to be approved by the CIE in December 2014. Two new technical task groups have been set up: single-photon radiometry and research on new standard illuminants based on white LEDs.

He noted that recent CCPR Guidelines on all aspects of key comparisons have been beneficial. Recent SI traceable measurements of total solar irradiance deviate by 0.3 % from the Physikalisch-Meteorologisches Observatorium Davos/World Radiometric Reference (PMOD/WRC) used by the WMO. The WMO is looking into ways to deal with this deviation from long-term records.

The President thanked Dr Usuda for his presentation and invited questions. It was commented that linking data from space-based instruments to the SI is vital and the progress mentioned in this respect is very welcome.

## 22. REPORT FROM THE BIPM CHEMISTRY DEPARTMENT, THE CCQM AND THE JCTLM

### BIPM Chemistry Department

Dr Wielgosz reported on the activities of the BIPM Chemistry Department. Dr Stoppacher, formerly a Research Fellow, has been made a permanent member of staff to continue with the mass spectrometry project and to run the new NMR facility.

He commented that the department receives very strong support from the NMIs in terms of secondments. The NMIs that actively support the chemistry programme were thanked. Over the last three years, the department has received almost 57 months of time from visiting scientists.

A new key comparison, CCQM-K115 'Peptide purity determination - synthetic human C peptide' will be coordinated by the BIPM and the NIM, China. A total of 16 laboratories (NMIs and DIs) have expressed an interest in participating. The NIM has sourced the materials and has agreed to send secondees to the BIPM for a period of two years to work on methods. The other new key comparison is CCQM-K120 'Ambient CO<sub>2</sub>'. Carbon dioxide levels in the atmosphere are reaching background levels of 400 µmol/mol and there is interest in measuring very small changes and trends in CO<sub>2</sub>. The level of uncertainty required in CO<sub>2</sub> standards is 6 parts in 10<sup>5</sup>. Isotopic composition becomes a factor at this level. In this respect, a number of instruments are being used to compare standards including GC, FTIR, optical spectroscopy and gas manometry.

The Chemistry Department has received two recent donations. Collaboration with the NMIJ, Japan, in the purity field resulted in the donation of an NMR instrument from JEOL, France. Collaboration with the KRISS, Republic of Korea, in the area of gas analysis will result in the donation of a GC-ECD instrument. In the first instance the GC-ECD instrument will be used to correct the BIPM's CO<sub>2</sub> measurements for nitrous oxide.

The President thanked Dr Wielgosz and invited questions. The CCU President encouraged the department to continue with its efforts to try and gain acceptance for the redefinition of the mole within the chemical community. Dr Usuda welcomed the successful installation of the NMR instrument following its donation from JEOL and in the wake of the development of the criteria for accepting donations from third parties. He asked if any consideration had been given to intellectual property rights or related issues. Dr Wielgosz commented that the intellectual property issue had been covered and that the rules for accepting donations had been followed strictly.

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

Dr May, President of the CCQM, spoke about the scope of chemistry and biology and the importance of the BIPM's programme to metrology in chemistry world-wide and its impact. The CCQM is responsible for 5 700 calibration and measurement capabilities (CMCs) currently published in the BIPM key comparison database (KCDB), covering 830 different analytes and 3 050 different analyte-matrix combinations.

He gave an overview of the importance and complexity of chemical measurements. The importance of chemistry to virtually all industrial sectors and the large and growing number of chemical entities in a broad range of matrices are driving an exponential increase in the interest and needs for comparisons and studies. There has also been a steady increase in the number of CMCs to review. To deal with this growth, the CCQM is establishing a strategic planning framework for Key Comparisons. The basis and structure for CMCs is being examined and the possibility of combining the Working Group on Inorganic Analysis (IAWG) and the Working Group on Electrochemical Analysis (EAWG) is being considered.

The Bioanalysis (BAWG) Working Group will be sub-divided to reflect the growing importance of biological measurements.

Dr May commented that he will attend a CCQM Symposium during the American Chemical Society (ACS) National Meeting in Boston, Massachusetts, on 16-20 August 2015. The symposium will consist of two sessions. The first will cover the importance and role of the mole and the kilogram in chemical and biological measurements and CIPM activities to redefine the mole and kilogram. The second session will be more practical and will cover the CCQM and its activities to assess and improve the equivalence of national standards for chemical and biological measurements. Significant efforts are being made to publicise the fundamental and practical work carried out by the CCQM and the NMIs that participate in the Committee.

Four requests have been received to become Members or Observers of the CCQM. The HSA, Singapore, and the NIMT, Thailand, have been approved and recommended to the CIPM for full membership (See Decision CIPM/103-35). Documentation supplied by the INTI, Argentina, and the KEBS, Kenya, was not sufficient to progress with their applications. The situation will be revisited when the requisite information is received.

The President thanked Dr May and invited questions. The significant growth in the biological sector was raised and it was queried whether this continued growth could result in a future requirement for a separate Consultative Committee for Biology. This may be the case in the future but at present the biological sector is not thought to be sufficiently advanced in its recognition of metrology to justify a separate CC.

Dr Wielgosz noted that a traceability exception document from the CCQM requires CIPM approval. The exception was raised by the IAWG and accepted by the CCQM. It relates to delta values for measuring isotope ratios which at present cannot be made traceable to the SI. Hence reference materials are used instead to define "delta scales". A listing of the reference materials that define the delta scales is provided in a report produced by IUPAC, which is regularly updated and referenced in the traceability exception document. The traceability exception states that reference materials listed in this report should be the basis for claims on delta scale measurements for traceability. Dr May suggested that discussions and approval could be carried out by correspondence.

**Decision CIPM/103-37** The CIPM asked Dr May to recirculate the request of the Consultative Committee for Amount of Substance: Metrology in Chemistry and Biology (CCQM) for traceability exception related to isotope ratio delta values to the CIPM members so that a decision can be made.

### **Joint Committee for Traceability in Laboratory Medicine (JCTLM)**

Dr Wielgosz, in his capacity as Executive Secretary of the JCTLM, gave a presentation with particular regard to the future funding of the JCTLM Secretariat. The number of nominations for new certified reference materials (CRMs) is steady at 40-50 per year. In 2014, 96 % of the CRMs in the database were produced by NMIs and DIs.

The International Federation of Clinical Chemistry (IFCC) has asked the JCTLM to look into its funding model. It has provided a donation to the BIPM of 50 000 € per year over the last ten years to run the Secretariat. The IFCC indicated in 2012 that it may not be able to continue with this level of support. In 2013 a workshop was held to determine if the JCTLM database is valuable to the *in vitro* diagnostics (IVD) industry and whether other sources of financial support could be found. An *ad hoc* Working Group was set up by the JCTLM Executive Committee in December 2013 to carry out a review. Visits to the JCTLM database remain at a constant level of 1 500 per month.

A teleconference was held among the members of the *ad hoc* Working Group on 10 September 2014 where there was a convergence of views about the future of the database. There was agreement that the

level of recognition of the JCTLM and its database needs to be increased so that the IVD industry will use it more frequently. It was agreed to decouple the issues of JCTLM membership and funding. Another JCTLM Working Group may be established to look into education and promotion of traceability. There were proposals that the membership of the JCTLM should be broadened to include organizations that used and benefitted from the establishment of traceable measurement systems. It was also proposed that the Executive Committee membership should be expanded to include other international organizations with activities in establishing standards in laboratory medicine. The IFCC confirmed in 2014 that its financial position has improved and that it would be able to continue to pay its current rate to maintain the Secretariat at the BIPM, with the proviso that the visibility and impact of the JCTLM is improved, but that other streams of funding would need to be identified to support new activities.

A position paper detailing these outcomes was presented to the CIPM bureau and it was of the opinion that there should be some distinction between members (those that can contribute to the database) and stakeholders (users of the database) of the JCTLM. This would avoid conflicts of interest and ensure a transparent system where it does not appear that those required to use the JCTLM products can influence which products appear in the database.

The President thanked Dr Wielgosz and asked the CIPM to comment on the proposal of the *ad hoc* Working Group to continue with the distinction between members and stakeholders. There was some confusion over the difference between members and the Executive Committee. It was made clear that the Executive Committee member organizations were the IFCC, ILAC and the CIPM and that the JCTLM had documented criteria for membership and currently had 26 organizations as members. Concerns were expressed that if private companies were to become members, and pay a fee, the credibility of the database will be undermined. After a brief discussion there was overall support to continue with the distinction between members and stakeholders.

**Decision CIPM/103-38** The CIPM is of the opinion that the Joint Committee for Traceability in Laboratory Medicine (JCTLM) should continue to distinguish between JCTLM members and stakeholders to avoid conflicts of interest and to ensure a transparent system.

## 23. REPORT FROM THE BIPM IONIZING RADIATION DEPARTMENT, THE CCRI, THE CCAUV AND THE CCT

### BIPM Ionizing Radiation Department

Mr Los Arcos gave an outline of the BIPM's activities in dosimetry, radionuclide metrology and thermometry in 2014. A new standard is being developed for medium-energy x-rays. This will eventually lead to a new comparison for directly-absorbed dose to water for medium-energy x-rays. The comparisons carried out in 2014 were summarized. The number of dosimetry comparisons increased significantly in 2014 to 17. The SIRTI was extended to  $^{18}\text{F}$  in 2014, which is one of the most widely used radionuclides for positron emission tomography (PET). A pilot study has started to investigate the extension of the SIR to  $\beta$ -emitters.

The President thanked Mr Los Arcos and invited questions. The future status of accelerator-based dosimetry was questioned. It was noted that this will be addressed in a workshop in March 2015.

### Consultative Committee for Ionizing Radiation (CCRI)

Dr Carneiro, President of the CCRI, presented the changes to the chairs of CCRI Sections I and III. The

Chairman of Section I will change from Dr Sharpe (NPL) to Dr McEwen (NRC) and Section III from Dr Thomas (NPL) to Dr Gressier (LNE-IRSN). Applications to become observers have been received by the CCRI(II) from the SMU, Slovakia, and by the CCRI(III) from the NRC, Canada (See Decision CIPM/103-35).

The status of the BIPM.RI(I)-K6 ‘Measurement of absorbed dose to water for high-energy photon beams’ comparison was presented. Results received from five participants shows that there is good equivalence among them to the order of 0.5 %. This is considered to be satisfactory as a basis for dissemination to hospital accelerators.

The CCRI is considering transforming Sections I, II and III into Working Groups. This has been proposed and discussed by correspondence within the CCRI.

Dr Carneiro commented that this will be his last presentation as the CCRI President as he is stepping down. The President thanked Dr Carneiro for his 10 years of service on the CIPM.

### **Consultative Committee for Acoustics, Ultrasound and Vibration (CCAUV)**

Prof. Valdés, President of the CCAUV, reported that the KEBS, Kenya, has applied to become an observer at the CCAUV (See Decision CIPM/103-35). This application was supported by the CCAUV. A total of four CCAUV comparisons were completed in 2014; three of which were piloted by the PTB and one by the NPL. Two CCAUV comparisons were launched, one in ultrasound piloted by the NPL and one in low-frequency vibrations piloted by the NIM, China.

The documents ‘CCAUV guidance for key comparisons’ and ‘Rules of procedure for the CCAUV KCWG’ have been posted on the CCAUV website. Discussions on a possible merger of the CCAUV Working Group for Key Comparisons (KCWG) and the CCAUV Working Group on Strategic Planning (SPWG) resulted in a decision to maintain both groups and to hold a joint meeting instead.

Two new chairs for the KCWG and the SPWG were announced. Dr Ripper (INMETRO) has taken over from Dr Bruns (PTB) as the Chairman of the KCWG and Dr Gaitan (NIST) has taken over from Dr Zeqiri (NPL) as the Chairman *ad interim* of the SPWG.

Prof. Valdés commented that this will be his final presentation as the CCAUV President. He expressed his good wishes to Dr Usuda, his successor as CCAUV President, and thanked Dr Allisy-Roberts and Dr Picard for their support as the Executive Secretaries of the CCAUV. He was thanked by the President for his years of service on the CIPM.

### **Consultative Committee for Thermometry (CCT)**

Dr Duan, President of the CCT, reported that the CMI, Czech Republic, has applied to become an observer in the CCT (See Decision CIPM/103-35). This application was supported by the CCT. Applications to become a Member from the HMI/FSB-LPM, Croatia, and an Observer from the INTiBS, Poland, did not receive the support of the CCT.

The CCT has proposed reducing the number of Working Groups from ten to six. The restructuring of its Working Groups has led to the creation of five objective-oriented Task Groups some of which will have a limited duration. A CCT Task Group for Environment (CCT-TG-Env) has been set up. This Task Group is considered to be a precursor to the creation of a Working Group.

The CCT has been invited to nominate experts to join the expert teams in the World Meteorological Organization’s Commission for Instruments and Methods of Observations (CIMO). Five experts will be sent. One member of CIMO has been invited to attend the CCT-TG-Env as a Member.

Progress on measuring the Boltzmann constant was described. This has led to CCT Recommendation T 1 (2014) ‘On a new definition of the kelvin’ which was presented for the CIPM to note. It was proposed

that NMIs should be encouraged to conduct experiments using primary methods that would realize the kelvin in real applications.

The President thanked Dr Duan and invited questions.

The wording in CCT Recommendation T 1 (2014) “[The CCT recommends] that the CIPM request the CODATA to adjust the values of the fundamental physical constants, from which a fixed numerical value of the Boltzmann constant will be adopted, when the following conditions are met [...]” was questioned. It was stated that the CIPM cannot request CODATA to make the adjustment. The request should be to the CIPM to bring any new data to the attention of CODATA. Dr Duan and Dr Quinn were asked to modify the text of the recommendation accordingly and their suggestion was “[The CCT recommends] that a fixed numerical value of the Boltzmann constant be adopted, when the following two conditions are met [...]”. The reference to “the CIPM request the CODATA to adjust the values of the fundamental physical constants” was dropped.

**Decision CIPM/103-36** The CIPM noted the decision of the Consultative Committee for Thermometry (CCT) to restructure its Working Groups and took note of Recommendation T 1 (2014) of the CCT.

## 24. REPORT FROM THE BIPM TIME DEPARTMENT, THE CCTF AND THE CCL

### BIPM Time Department

Dr Arias reported on the activities of the BIPM Time Department. The major achievements in 2014 were highlighted. A new model for clock weighting was implemented in January 2014 and introduced into the algorithm for International Atomic Time (TAI). Uninterrupted publication of Rapid UTC has been carried out every Wednesday since it was introduced in July 2013. There are now 42 participants, representing 60 % to 70 % of the clocks contributing to Coordinated Universal Time (UTC). The difference [ $UTC - UTC_r$ ] is minimized by steering to UTC after publication of BIPM *Circular T*. There is a mean difference of  $-0.21$  ns. When the stability of UTC and  $UTC_r$  are compared, UTC demonstrates a stability at one month of  $3 \times 10^{-16}$  while for  $UTC_r$  the stability is  $4 \times 10^{-16}$ .

Progress has been made with time transfer using optical fibres to compare and validate the links. Global Positioning System Precise Point Positioning (GPS PPP) has been validated against a 420 km optical fibre link between the GUM and the AOS, both in Poland. The standard calibrator developed at the BIPM was used alongside the transceivers at the ends of the optical fibre link. The links and the calibrations were then compared. The aim is to reduce the uncertainty of the calibration. A uB value of  $\leq 2$  ns is considered realistic.

The Time Department completed guidelines for Global Navigation Satellite Systems (GNSS) equipment calibration in 2014. The guidelines were developed at the request of the CCTF and were deemed necessary because there are 74 laboratories in UTC and the calibration of all equipment needs to be repeated regularly. The calibration scheme proposed in the guidelines involves coordination between the BIPM and the RMOs.

The BIPM has been involved in discussions with the International Telecommunication Union – Radiocommunication Sector (ITU-R), the International Union of Radio Science (URSI) and the International Astronomical Union (IAU) with regard to the redefinition of UTC. Three more meetings and workshops are planned which will focus on the redefinition of UTC, culminating in the World Radiocommunication Conference 2015 in Geneva, Switzerland, on 2-27 November 2015 where a

decision will be taken on the redefinition.

The President thanked Dr Arias and invited questions and comments. It was queried whether the work on optical fibre links will continue. Dr Arias noted that optical links between the Paris Observatory (LNE-SYRTE) and two other NMIs (the NPL and the PTB) will be completed by the end of 2015. The current non-permanent links allow validation of calibrations that are more accurate than GNSS calibrations. She expressed the hope that in the future, permanent optical links will become available.

### **Consultative Committee for Time and Frequency (CCTF)**

Mr Énard, President of the CCTF, gave a brief presentation. The CCTF has not met during the last 12 months and its next meeting is scheduled for September 2015. The CCTF Working Group on Two-Way Satellite Time and Frequency Transfer (WGTWSTFT) met in 2014 to discuss the preparation of guidelines for TW calibration for implementation in 2015. The CCTF Group on GNSS Time Transfer (WGGNSS) met twice and worked on guidelines for GNSS equipment calibration which have been implemented and are in use. The CCTF Working Group on Coordination of the Development of Advanced Time and Frequency Transfer Techniques (WGATFT) met to establish a task group on optical fibre links. The joint CCL-CCTF Frequency Standards Working Group (WGFS) met on 26 June 2014.

Requests from the GUM, Poland, the MIRS, Slovenia, and the UME, Turkey, to become members of the CCTF will be discussed at the CCTF meeting in September 2015.

The President thanked Mr Énard. There were no questions or comments.

### **Consultative Committee for Length (CCL)**

Dr Sacconi, President of the CCL, gave a short presentation on its work. The joint CCL-CCTF Frequency Standards Working Group (WGFS) met on 26 June 2014. The Working Group discussed the preparations that are under way for amendments to the list of recommended values of standard frequencies. No new insertions are expected, except for the adjustment of some figures and uncertainties. The increasing importance of the measurement of frequency ratios between sources was highlighted, particularly for optical frequency standards.

The Working Groups on the MRA and Strategy met during October 2014. The CCL Strategy document was finalized in February and the Working Group is planning regular updates to this document. The problems of managing a complex multi-dimensional comparison were highlighted. For one such comparison in the CCL there were 960 results. When this is multiplied by the number of participants, issues arise about how to represent the results.

Dr Sacconi noted that representatives from Versailles Project on Advanced Materials and Standards (VAMAS) will be invited to the next meeting of the CCL. He finished by saying that this was his last presentation to the CIPM as President of the CCL.

The President thanked Dr Sacconi and invited questions and comments. Mr Énard commented that the measurement of frequency ratios is relevant to the redefinition of the second.



## 25. PROPOSED CHANGES TO CC MEMBERS AND OBSERVERS

**Decision CIPM/103-35** The CIPM accepted the following changes to the Consultative Committees:

- CCPR
  - CMI (Czech Republic): Member
  - CMS/ITRI (Chinese Taipei): Observer
  - MKEH (Hungary): withdrawal as Member
- CCRI
  - SMU (Slovakia): Observer at CCRI(II)
  - NRC (Canada): Observer at CCRI(III)
- CCAUV
  - KEBS (Kenya): Observer
- CCT
  - CMI (Czech Republic): Observer
- CCQM
  - HSA (Singapore): Member
  - NIMT (Thailand): Member

## 26. PRESENTATION BY THE DELEGATION FROM THE ISLAMIC REPUBLIC OF IRAN

The delegation from the Islamic Republic of Iran (“Iran”) joined the meeting and they were welcomed by the President. The delegation consisted of Dr Hossein Mohammad Nabi from the Iranian Central Bar Association and Mr Behzad Azarsa and Mr Sattar Ahmadi from the Embassy of the Islamic Republic of Iran in Paris. Ms Arlen, head of the BIPM Legal, Administration and Human Resources Office, also joined the meeting.

They stressed that they wish to cooperate with the BIPM to find a solution to their outstanding payments. Iran reached an initial Rescheduling Agreement with the BIPM in October 2012 and is committed to working with the BIPM going forward. Discussions with the Director of the BIPM have been very productive and the support of the CIPM is now being sought.

The President stated that a clear objective of the CIPM and the BIPM is that Iran remains an active member of the BIPM and participates in its activities. The CIPM will consider what it can do to bring this about. The Director explained that the agreed payments for 2013 and 2014 had not been fulfilled and this had led to a suspension of rights. Since then there had been an exchange of *Note verbales* the month before the meeting and a large payment is now in progress. He asked the Iranian delegation to explain the situation to the CIPM.

The delegation explained that the Institute of Standards and Industrial Research of Iran (ISIRI) has sent around 500 000 € in two instalments as a contribution and as a rescheduled payment of the arrears for

2013-2014. It is expected that the BIPM will receive this amount in the near future and the Iranian Embassy is doing everything it can to facilitate this. This payment is a special case because the transfer of money from commercial and personal sources in Iran was subject to international sanctions. They reiterated that under sanctions it is difficult for the Central Bank of Iran to send money out of the country. The Director of the BIPM confirmed that he has documentation confirming that two transfers are under way. He had visited the French Foreign Ministry on 7 November to discuss the situation and they indicated that they will work with the BIPM's bank to do what they can to facilitate the transfer, since transfers from the Iranian Government are permitted.

The Director explained how the BIPM might move forward with the issue and why it is being discussed ahead of the CGPM meeting. The CIPM bureau took the view that a complex item on a rescheduling agreement and membership would require advanced warning to the Member States before being tabled at a CGPM meeting.

He observed that Iran would soon be considered to be fully paid up under the terms of the Rescheduling Agreement that was signed in 2012. He then proposed that if this agreement could then be frozen it would give the CIPM time to re-examine the situation. The 2012 agreement clearly stated the intention of Iran to attend the 25th CGPM meeting, although this has been affected by subsequent non-payment of contributions and arrears that led to suspension. As a result, there has been no progress on the case. It was suggested that when Iran regains the status of being continuously paid up as a Member State, the CIPM should prepare a case for consideration by the CGPM at its 26th meeting. The Director commented that the CIPM would discuss this later in a closed session of the meeting. The Iranian delegation thanked the CIPM for making this suggestion which it considered to be very constructive.

The Director commented that Iran would be able to attend the 25th CGPM meeting now that the transfer of 500 000 € is under way. A formal invitation will be issued to the Iranian Embassy in Paris, conditional on confirmation that the money has been received by the BIPM's bank.

The President thanked the Iranian delegation, noting that this is a positive step and that the CIPM will give the issue serious consideration. The Iranian delegation thanked the CIPM for their support and the work that has been done towards reaching an agreement. They left the meeting.

## **27. REVIEW OF THE ISSUES RAISED BY THE DELEGATION FROM THE ISLAMIC REPUBLIC OF IRAN (IN CAMERA)**

The Director gave the CIPM some more background information on the situation regarding Iran. They had signed a rescheduling agreement with the BIPM in October 2012, with the explicit wish to attend the 25th CGPM meeting in order to ask it to address the matter of the total sums due with regard to their Member State status. However, they had fallen behind with their payments and consequently their rights had been suspended and they were not invited to the General Conference. A letter was received on 28 October 2014 reminding the BIPM of the intention of Iran to attend. An exchange of *Notes verbales* resulted in a commitment by Iran to pay 500 000 € which would cover their contributions and payment of arrears for 2013 and 2014. This would bring them up to date in terms of the Rescheduling Agreement. This would be sufficient to allow them to attend the General Conference. As mentioned, these payments are under way but are subject to delays in the banking system.

The bureau proposes freezing the payment of Iran's arrears in order to prepare for discussion at the 26th CGPM meeting. Iran must continue to pay its membership contributions each year and within the

year. Failure to make its annual payments within the year will result in suspension and would delay the preparation of the said discussion. Meeting these conditions will further demonstrate Iran's goodwill and commitment to continue working with the BIPM.

The history of Iran's membership was recalled and there was a discussion of the current situation, the rescheduling agreement and the proposal to freeze the payments. The Director asked the CIPM for its approval to prepare an agreement to freeze the arrears on the condition that Iran continues to pay its membership contributions each year and within the year. If these conditions are met the CIPM will go ahead and prepare the discussion for the 26th CGPM. There were no objections and the CIPM approved the proposal.

**Decision CIPM/103-39** The CIPM noted that the BIPM was informed of two bank transfers being processed from the National Standards Organization of Iran for the settlement of the total sums due for 2013 and 2014 and that in view of the dates of these transfers, the position of the Islamic Republic of Iran with regard to its membership status since 1979 could not be included in the convocation to the 25th CGPM meeting.

In order to allow the CGPM to duly address this position at its 26th meeting, the CIPM and the Islamic Republic of Iran decided to freeze the effects of the Rescheduling Agreement made in 2012 through a new agreement that inter alia requires continuity in payment of the Member State contribution by the Islamic Republic of Iran in the year it is due.

## 28. REPORT ON COORDINATION AND LIAISON

Mr Henson reported that Sudan and Yemen became Associates on 26 June and 21 July 2014 respectively. The CIPM MRA was signed by the NMIs of Iraq, Sudan and Luxembourg on 13 June, 26 June and 1 October 2014 respectively. The NMIs of Yemen and Lithuania will sign the CIPM MRA on 17 November 2014. This is the second time that a Lithuanian institute will have signed the CIPM MRA, a situation that was triggered by the dissolution of its NMI and responsibility passing to a DI. The NMI of Oman will sign the CIPM MRA on 21 November 2014.

Azerbaijan will attend the 25th CGPM meeting as a guest of the CIPM President. It has completed the application process to become an Associate and has paid its subscription for 2015. It will therefore become an Associate on 1 January 2015, after the CGPM meeting, and it has thus been considered appropriate that it be invited as a guest.

Of the seven Member Countries of the GCC Standardization Organization (GSO), Saudi Arabia is a Member State of the BIPM and Oman and Yemen are Associates. The other countries (Bahrain, Kuwait, Qatar and the United Arab Emirates) are involved in ongoing talks with the BIPM to become Members or Associates. The NMIs of all seven countries are part of GULFMET, the new RMO established by the GSO. GULFMET also has three Associate members (Turkey, Egypt and Bosnia Herzegovina). It is important that GULFMET broadens its participation in the BIPM's activities in order to gain international recognition and it is hoped that more of its Members will come to the table in 2015.

Ethiopia and Nicaragua have indicated an interest in becoming Associates in the near future. There are indications that the BIPM might receive an expression of interest from Kosovo, which will require careful consideration because of its special status.

Latvia is one of the Associates currently on the "escalator" (see Resolution 4 of the CGPM (2011)) and it

had indicated that it may leave due to the increasing subscription rate. The BIPM has had discussions with the Latvian NMI to help it formulate arguments to remain as an Associate when it discusses the situation with its government. The Philippines and Slovenia, both of which are also Associates on the escalator, have made initial enquiries about the mechanics and costs of becoming Member States.

Sri Lanka is close to being excluded for non-payment of its subscriptions. Unless payment is received by the end of 2014 it will trip the mechanism, following three years of unpaid subscriptions, which will lead to automatic exclusion. A *Note verbale* warning Sri Lanka of the situation was sent in April 2014.

In terms of liaison activities, Mr Henson reported that he was invited by the World Trade Organization (WTO) to attend the Technical Barriers to Trade (TBT) Committee meeting and participate in the seminars on conformity assessment. He gave a well-received lecture on metrology and its benefits to 250 trade negotiators. He also made a formal statement to the WTO that redefinition of the SI base units is not expected to have a direct impact on trade.

Interactions between the BIPM and the WMO are strengthening particularly through collaboration with the CCQM, CCPR and CCT (see §23). There has been a dialogue with the United Nations Framework Convention on Climate Change (UNFCCC) secretariat about possibility of more NMI experts participating in their Working Groups. There have also been liaison activities with the NCSLI, the DCMAS Network and the United Nations Industrial Development Organization (UNIDO). The BIPM participated in the provision of training at the AFRIMETS Legal Metrology School which was held in Tunisia in October 2014. There has been ongoing engagement with the International Laboratory Accreditation Cooperation (ILAC), ISO and particularly ISO CASCO. The revisions of ISO 17025 and ISO Guide 34 will be discussed later in the agenda.

The poster for World Metrology Day 2015 will be designed by AFRIMETS and the NMISA, South Africa, has volunteered to coordinate the design. The theme is 'Measurements and light' which was chosen to align with the 2015 UNESCO International Year of Light and light-based technologies.

The President thanked Mr Henson and invited questions. Dr Inglis asked about the level of interaction between the BIPM and GULFMET. Mr Henson commented that the BIPM engages with GULFMET intensively and directly and through the JCRB.

## **29. REPORT FROM THE JCRB INCLUDING STEPS TOWARDS THE REVIEW OF THE CIPM MRA**

Mr Henson reported that the JCRB did not hold a meeting in autumn 2014 due to preparations for the CGPM. The JCRB has formulated a series of preparatory actions and recommendations for the review of the CIPM MRA. Comments from the CCs which were included in the CC strategy documents regarding the CIPM MRA have been collated and supplied back to the JCRB for consideration. Results from the CCQM questionnaire on the CMC process have been analysed. The KCDB pop-in questionnaire confirmed that the majority of users are from the metrology community although a significant number were from the outside, including commercial accreditation laboratories, testing labs, industrial companies and regulators.

The actions taken by the JCRB in preparation for the review of the CIPM MRA were outlined. EURAMET has proposed series of ideas for consideration which are aimed at simplifying the system and improving its efficiency. These are included in a paper that has been made available to the other RMOs. The intentions of the CIPM MRA review have been collated and this forms the basis of the

Draft Resolution E. The RMOs will come forward with their ideas on the challenges and practical ways forward for the CIPM MRA at the JCRB meeting in March 2015. A workshop is planned for 2015 to engage in a broad discussion of the CIPM MRA with NMI Directors, Member State representatives, RMO representatives and other relevant stakeholders. At the workshop a review committee will be established to finalise the review.

It was noted that the CC strategies have brought clarity and strategic direction to comparisons and in some cases have actually led to a reduction in the number of working groups and comparisons. The practical outcomes from the Workshop on Best Practices in CMC Reviews in March 2013 included a reduction in the mean time for the second stage inter-regional review process from 132 days to 76 days.

### 30. CIPM POSITION ON REVISIONS OF ISO/IEC 17025 AND ISO GUIDE 34

Mr Henson reported that the International Organization for Standardization (ISO) has implemented a New Work Item to undertake a full review of ISO/IEC 17025. The first meeting towards this review will be in early 2015. He has been nominated as a member of the Working Group in ISO CASCO (WG44) that will carry out the review as a liaison person and noted that the BIPM can have up to three people on the Working Group. He suggested that it would be useful for a member of the CIPM to be on the Working Group because ISO/IEC 17025 underpins all the NMIs and the responsibility for the review should not be borne solely by the BIPM. The President commented that Dr Kaarls has volunteered to participate in the Working Group. The CIPM supported this proposal unanimously.

He went on to report that Dr Westwood from the BIPM Chemistry Department has been nominated to take part in the joint ISO REMCO/CASCO Working Group to develop a standard (ISO 17034) for the production of reference materials based on the current guide (ISO Guide 34). The possibility exists to nominate a CIPM representative to serve alongside Dr Westwood. Dr McLaren volunteered to serve on the Working Group and the CIPM agreed unanimously.

**Decision CIPM/103-40** The CIPM nominated:

Dr Kaarls as CIPM representative to participate with Mr Henson, BIPM, in the ISO Working Group to revise ISO 17025,

Dr McLaren as CIPM representative to participate with Dr Westwood, BIPM, in the ISO Working Group to revise ISO Guide 34.

### 31. REPORT FROM THE JOINT COMMITTEE FOR GUIDES IN METROLOGY (JCGM)

#### JCGM Working Group on the Expression of Uncertainty in Measurement (GUM) – WG1

Dr Milton updated the CIPM on developments with the Guide to the Expression of Uncertainty in Measurement (GUM). The WG1 has made good progress on the preparation of the revised GUM and it is close to being circulated as a 'Committee Draft'. He asked the CIPM for clarification about who the Committee Draft should be circulated to for comment. There was a brief discussion and it was agreed that it should go to all NMI Directors with a clear timescale for response.

## **JCGM Working Group on the International Vocabulary of Metrology (VIM) - WG2**

Dr Milton commented that as a member body of the WG2, the BIPM is entitled to send three delegates to its meetings. At present, the sole representative to the WG2 is Dr Thomas who is retiring in 2015. He suggested that the CIPM should come forward with suggestions for individuals that can participate in WG2. It was noted that this is for consideration and will be revisited at the CIPM meeting in March 2015.

## **32. FUTURE BIPM WORKSHOPS AND MEETINGS**

### **BIPM Workshop on Measurement Uncertainty, 15-16 June 2015**

The workshop will gather and debate the comments received on the new draft of the GUM. Speakers will be invited from areas that are not well covered by the GUM to address challenges outside of its normal scope.

### **BIPM Workshop on Global to Urban Scale Carbon Measurements, 30 June-1 July 2015**

This follows on from the joint WMO-BIPM Workshop on Measurement Challenges for Global Observation Systems for Climate Change Monitoring: Traceability, Stability and Uncertainty which was held in March 2010. The workshop has three themes: Carbon measurement and other related climate variables - Global systems, principles and traceability; Megacities and Metrology Needs for Supporting Greenhouse Gas Mitigation - Urban Greenhouse Gas Domes; and Standards for greenhouse gas emission inventories.

It is anticipated that both Workshops will be made available as webcasts.

### **BIPM/VAMAS Workshop on Challenges in Materials Metrology, 2016**

A joint workshop with the Versailles Project on Advanced Materials and Standards (VAMAS) is planned for 2016. A steering group with four members has been set up to develop the objectives for the workshop. The steering group will hold a brainstorming session with the CIPM bureau in March 2015 to formulate the themes of the workshop. The President asked the members of the CIPM to reflect on the themes that could be addressed in the workshop and to provide the steering group with suggestions by the end of January 2015.

**Decision CIPM/103-41** The CIPM agreed to reflect on themes to be addressed by the BIPM/VAMAS Workshop “Challenges in materials metrology” planned in 2016; and make suggestions to give guidance to the workshop steering group by the end of January 2015.

### **Future meetings**

The 104th meeting of the CIPM (Session I) will be held on 9-10 March 2015 and the 33rd meeting of the JCRB will be on 18-19 March 2015. The NMI Directors Meeting will be held on 13-14 October 2015. It will focus on the review of the CIPM MRA and the programme will be drafted in March 2015.

### 33. PROPOSED REVISIONS TO THE BIPM RULES AND REGULATIONS (RRI)

Dr Milton asked for CIPM approval for one final amendment to the BIPM Rules and Regulations (RRI). In Rule 6.3.1 'Status and content of personal file', the word 'centrally' has been inserted into the sentence so that it reads 'A personal file shall be kept centrally for each staff member'. The revised version of the document (CIPM/14-10) showing this amendment and the previous amendments which had been agreed by correspondence had been made available to the CIPM via the website. The CIPM unanimously approved the insertion of the word 'centrally'.

**Decision CIPM/103-42** The CIPM approved the proposed changes to the BIPM Rules and Regulations (RRI), document CIPM/14-10.

### 34. THE BIG $G$ CONSORTIUM

Dr Quinn presented a proposal, drafted jointly with Dr May, to the CIPM for the creation of a small consortium of NMIs 'The big  $G$  consortium', to facilitate new work aimed at resolving the present disagreement among recent measurements of the Newtonian constant of gravitation,  $G$ . This issue had been discussed at Session I of the 103rd meeting of the CIPM (See §21.2) and Decision CIPM/103-23 stated that "The CIPM would welcome the presentation of a formal proposal on the creation of an advisory board on  $G$  experiments at its next meeting." The full proposal including appendices had been made available to the CIPM via the website. It included a suggestion that the consortium would be coordinated initially by the NIST and that an annual report would be made to the CIPM on progress. It also requested the BIPM to provide facilities for occasional meetings of those taking part in the work.

He noted that something should be done to resolve the present discrepancy in measurements of  $G$  by addressing the two outliers, namely the BIPM measurements that are high and the JILA measurements that are low. An advantage of setting up a consortium was stated as overcoming problems associated with institutes or laboratories that want to participate, but which are not NMIs. In such cases it is essential that their measurements are traceable to the SI via an NMI that is part of the CIPM MRA. Establishing an international consortium would facilitate interaction between participating NMIs.

The President asked why the NIST should not establish the consortium if it is initially coordinating it. Dr Quinn responded that if the consortium is under the auspices of the CIPM it will facilitate NMIs to give free assistance to other laboratories. He suggested that the CIPM should report that the consortium has been set up and should inform NMIs. He also noted that the consortium is a long-term project. Dr May commented that resolving the present disagreement among recent measurements  $G$  is the general responsibility of the CIPM. The NIST will coordinate the work but it should be a joint project.

**Decision CIPM/103-43** The CIPM agreed to establish a consortium of national metrology institutes and other institutes, coordinated by the NIST, to facilitate new work aimed at resolving the present disagreement amongst measurements of the Newtonian constant of gravitation,  $G$ . The BIPM will provide facilities for meetings of those taking part in this work.

### 35. ANY OTHER BUSINESS

Dr Quinn commented that he had been awarded a medal in September 2014 by the vice-premier of China for his long-term support of Chinese metrology. It was awarded following a recommendation by the NIM. Most of this support was during his time as Director of the BIPM; therefore it represents recognition of the work of the BIPM by China.

Dr Nava-Jaimes commented that this was his last CIPM meeting as he was stepping down. He thanked the CIPM for their friendship and support and said that it had been a privilege to have been a member of the CIPM. The President thanked Dr Nava-Jaimes and wished him well for the future.

Prof. Valdés raised a question with reference to Resolution 1 of the CGPM (2011) and the discussions over Draft Resolution A ‘On the future revision of the International System of Units, the SI’. Resolution 1 invited the CIPM to continue its work towards improved formulations for the definitions of the SI base units in terms of fundamental constants. He gave his opinion that it is not clear what has been decided regarding the definitions of the units. He referred to his presentation at Session I of the 103rd meeting of the CIPM (§16) and gave a summary of new research towards defining the kilogram by fixing the value of the Planck constant ( $h$ ) or the mass of the atom and the pros and cons of each. He noted that there has been no formal decision to go forward using a definition of the kilogram based on fixing  $h$  and that either a decision is needed or a statement that it has not yet been agreed. The President commented that his understanding was that this had been implicitly agreed when the proposed definitions that came out of the CCU had been accepted. He acknowledged that no formal decision had been taken to use a definition of the kilogram based on fixing  $h$ .

Dr Ullrich summarized the history of the development of the CCU Recommendation ‘On the possible future revision of the International System of Units, the SI’ in the CCU. This was submitted to the CIPM in 2010 and went forward to become Resolution 1 of the CGPM (2011). He recalled that the CIPM at its 99th meeting (2010) had voted in favour, with four abstentions. Prof. Valdés commented that although Resolution 1 of the CGPM (2011) had been passed he was still unclear whether the issue defining the kilogram based on fixing  $h$  or by using another method had been agreed. Dr Quinn remarked that Resolution 1 of the CGPM (2011) and the draft SI brochure have been available on the BIPM website for comments and suggestions for a considerable period and that none have been forthcoming. He went on to note that by fixing  $h$ , the possibility exists for future electrical measurements to improve its precision without limits. By fixing the mass of an atom and relying on  $h/m$  measurements, precision would be limited depending on knowledge of  $\alpha^2$ . This is known to parts in  $10^{10}$  and is not expected to improve. Following further in-depth discussions it was concluded that there are insufficient new results available to suggest that we should change from defining the kilogram based on fixing  $h$ . If new results become available in the future favouring a different approach, this would come up in the CCU automatically.

Prof. Uğur commented that this was his final CIPM meeting and that it had been a privilege to serve on the committee. The President thanked him for his thoughtful comments and wisdom and wished him well for the future.

### 36. CLOSURE OF MEETING

The President thanked the BIPM staff for their support throughout the meeting and that he looked forward to seeing most of those present at the CGPM meeting.



## Appendix 1

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

(March 2014 - November 2014)

Note: this report is the second part of the Secretary's report to the CIPM, presented at Session II of the 103rd meeting of the CIPM in November 2014.

#### 1. Meetings of the bureau of the CIPM (the "bureau")

Since the last meeting of the CIPM on 12-13 March 2014, the bureau met on 16-18 June 2014 and on 11-12 November 2014 at the Pavillon de Breteuil.

During the period March to November 2014 the Secretary made a number of additional visits to the BIPM:

- during the period of absence of the Director for medical treatment, the Secretary continued to chair the monthly BIPM Management Team meeting, held on 2 April 2014;
- he chaired the meetings of the CIPM Sub-Committee on the Pension Fund and Health Insurance, held at the BIPM on 16 June 2014 and on 16 September 2014, and
- he also attended the annual Management Review meetings of the BIPM Quality Management System and of the BIPM Occupational Health and Safety Management system, both of which were held at the BIPM on 2 October 2014.

During March to November 2014 the President and the Secretary held a number of teleconferences with the Director of the BIPM, in particular addressing issues in preparation for the 25th CGPM, such as the communication with the Member States, the Convocation and agenda of the CGPM, the BIPM Mass Scale, the CIPM Renewal process, and the organization of the informal, preliminary CGPM meeting regarding the BIPM Work Programme, its associated budget and corresponding dotation, which will be held at the BIPM on the morning of 17 November 2014.

#### 2. CIPM Renewal Process and CIPM Membership

In conformity with the document "Criteria and Process for Election of CIPM Members" all current CIPM Members had signed a declaration by the end of March 2014 tendering their resignation from the CIPM with effect from the opening of Session I of the 104th meeting of the CIPM, scheduled for March 2015.

A first call for candidates for the next CIPM, to be elected at the 25th CGPM on 20 November 2014, was sent out to all Member States and their NMIs on 17 January 2014, and it was also published on the BIPM website. A second call was sent out on 4 April 2014.

Finally, by the end of August 2014 a total of 28 applications had been received, but during the period May to August 2014 five were withdrawn or were not further underpinned with the required information.

On the list of the 23 remaining proposed candidates, there were only two female candidates and both

were from the EURAMET region. No female candidates were nominated from the AFRIMETS, APMP, COOMET or SIM regions. These 23 nominations were all assessed as qualified for CIPM membership.

A first consultation process among the members of the CIPM, coordinated by the Secretary, took place during the period 27 August - 26 September 2014.

A second vote by the members of the CIPM with respect to a group of candidates who scored in the consultation process almost the same was held during the period 26 - 29 September 2014.

As a result of the CIPM consultation process a List with recommended candidates was made up and forwarded to the *ad hoc* Working Group (AHWG), established by the 24th CGPM (2011), on 29 September 2014.

The assessment of a group of 17 applicants was undisputable, followed by a group of four applicants with a lower score and mutually only marginal differences. After careful consideration, the AHWG agreed on a slate of 18 recommended candidates. This slate of recommended candidates, together with the list of the other applicants, supported by all relevant information, has now been made available to the Member States for their consideration and election.

### **3. Member States of the BIPM (Member States) and Associates of the CGPM (Associates)**

During March - November 2014 the number of Member States remained at 56.

On 26 June 2014 the Republic of the Sudan joined as an Associate of the CGPM, and on 21 July 2014 the Republic of Yemen joined as an Associate of the CGPM, bringing the total number of Associates to 41.

With reference to the Resolution 4 “On the status of Associate State of the General Conference”, adopted by the CGPM at its 24th meeting (2011), so far, none of the 15 Associates for which it would be appropriate to become Member States have formally indicated their intention to do so in the near future.

However, the NMIs from the Philippines and Slovenia are in dialogue with the BIPM as they are making the case to their respective Ministries for transition from an Associate to a Member State.

The BIPM is also in dialogue with the NMI from Latvia as they try to make a case to their Ministry to avoid terminating their Associate status, following the increases in their subscription resulting from Resolution 4 of the CGPM (2011).

The BIPM will continue to monitor whether all these Associates are paying their increased contributions.

As of mid-November 2014 the following Associates had CMCs published for the first time:

- Estonia, which became an Associate in January 2005 and published its first CMCs in May 2014;
- Georgia, which became an Associate in January 2008 and published its first CMCs in March 2014;
- Peru, which became an Associate in May 2009 and published its first CMCs in August 2010;
- Paraguay, which became an Associate in May 2009 and published its first CMCs in January 2011.

These four Associates now meet the criteria and will be discussed at the CIPM with a view to formally encouraging them to become Member States.

#### 4. Member States and Associates in financial arrears for more than three years

Currently none of the Member States and Associates have arrears for more than three years. However, the BIPM will continue to monitor the timely payment of the dotation by those Member States with which a rescheduling agreement has been signed.

Overall, the payment of the required dotation and contribution by the Member States and Associates is following the yearly pattern expected.

#### 5. Preparations for the 25th meeting of the CGPM

The President of the French *Académie des Sciences*, Prof. P. Taquet has accepted the invitation to chair the 25th CGPM, to be held on 18-20 November 2014 in Versailles, France.

The detailed agenda of the 25th CGPM has been defined and speakers, representatives of other international organizations and bodies, closely cooperating with the BIPM, have been invited.

All information and documents underpinning the agenda of the 25th CGPM have been made available to the Member States and Associates of the CGPM on the BIPM webpage dedicated to the 25th CGPM.

In particular much time has been spent on the careful development of the BIPM Strategy, its Programme of Work and the BIPM budget, and related communication and meetings with a good number of Member States and their NMIs.

Likewise, considerable time has been devoted to the future development of a sustainable BIPM Pension and Provident Fund and its financial consequences for the BIPM budget, the BIPM staff, retirees, and the Member States.

Based on experience in the past, a number of Member States have been invited to attend the informal preliminary meeting on the BIPM Work Programme, its associated budget and related Dotation for the period 2016-2019, to be held at the BIPM on the morning of 17 November 2014. The list of Member States invited to attend this informal meeting has been published on the BIPM website, making it possible for those Member States that have not been invited directly to indicate their interest in attending this preliminary meeting.

With reference to the Draft Resolution B of the 25th meeting of the CGPM, a Draft Procedure for the election of the “Committee for CIPM Election” has been developed in close cooperation with the AHWG. A list of candidates representing the Member States in the Committee for CIPM Election has been drafted. On the basis of the draft Procedure the CGPM is expected to elect its representatives in the Committee for CIPM Election. It is proposed that the draft Procedure will be completed, agreed and approved later by the Committee for CIPM Election and the CIPM.

#### 6. CIPM Sub-Committees and CIPM *ad hoc* Working Groups

The CIPM Sub-Committees for Finance, on the Pension and Provident Fund and Health Insurance, and the *ad hoc* Working Groups on CIPM Membership, and Conditions of Employment, have continued their activities and will report on their activities later in the agenda of this meeting.

## 7. Presidency of Consultative Committees (CCs)

As a consequence of the resignation in March 2015 of a number of CIPM members who are also the President of a Consultative Committee and the wish of some of the outgoing Presidents to resign already in November 2014, the bureau has started to consult some members of the CIPM about their interest in filling the upcoming vacancies. A timely decision to appoint a new President of the CCRI is imminent, as a number of meetings are scheduled for the first months of 2015.

## 8. The CIPM MRA

On 13 June 2014 the Iraq Central Organization for Standardization and Quality Control (COSQC) in Baghdad signed the CIPM MRA. On 26 June 2014 the Sudanese Standards and Metrology Organization (SSMO) in Khartoum signed the CIPM MRA, and on 1 October 2014 the Luxembourg Institute for Standardization, Accreditation, Security and Quality of Products and Services (ILNAS) signed the CIPM MRA on behalf of its Bureau of Metrology in Belvaux. This increased the number of signatories to 96 institutes from 53 Member States, 39 Associates and 4 international organizations, and covering a further 152 institutes designated by the signatory bodies.

It is expected that the number of signatories of the CIPM MRA will continue to increase.

The JCRB met on 26-27 March 2014 at the BIPM. It was agreed that from now on the need for a second half year meeting will be considered on a case by case basis. In 2014 no second meeting was held. A report will be presented later in the agenda.

The next meeting of the JCRB will be held at the BIPM on 18-19 March 2015.

## 9. Relations with other bodies

9.1. As a follow-up of the meeting of the CIPM bureau on 10 March 2014 with the VAMAS leadership, VAMAS is now proposing a VAMAS - BIPM/CIPM Workshop or Symposium focused on Advanced Materials Characterization, highlighting the role of Standards and Measurements for Materials Properties.

9.2. Following up a very successful JCTLM members and stakeholders meeting held at the BIPM on 4-6 December 2013, the JCTLM Executive has initiated an in depth discussion on the costs of the JCTLM secretariat and the JCTLM database at the BIPM. The JCTLM Executive has now studied the desirability and possibilities of involving more international organizations and bodies with an interest in reliable and traceable measurements in clinical chemistry and laboratory medicine in the JCTLM Executive, or at least as JCTLM ordinary members.

New criteria have been developed for “ordinary membership” of the JCTLM, while also a much broader regular communication with the wider clinical chemistry and laboratory medicine community is being discussed, which should lead to a broader basis. As a provisional result it is expected that the IFCC and the BIPM will continue to share the costs of the JCTLM secretariat and database as maintained at the BIPM. This point will be further addressed later in the agenda.

ISO/IEC17025 is to be revised and guidance to the BIPM on its liaison role will need to be discussed.

ISO Guide 34 is to become a standard under the joint direction of ISO REMCO and ISO CASCO. Guidance to the BIPM on its liaison role will need to be discussed.

## 10. The BIPM Mass Scale

The mid-2014 observed offset in the value of mass standards maintained at the BIPM has been of great concern to the BIPM and the CIPM bureau. The activities immediately undertaken by the BIPM, CCM and the CCM Support Group, as well as the communication with all relevant stakeholders has been adequate and well appreciated. A report will be presented, while also future preventive actions, based on the lessons learned, will be discussed.

## 11. BIPM administrative and staff matters

- 11.1. The BIPM (re-)organization is now largely settled. A re-location of laboratories and staff offices is under way, improving the laboratory conditions and offices, as well as the efficiency of, and cooperation within the BIPM.

- 11.2. Additional reports commissioned to Mercer studying a number of different possible scenarios concerning a sustainable BIPM Pension and Provident Fund have been delivered and were discussed by the CIPM Sub-Committee on the Pension and Provident Fund and Health Insurance at its meetings on 16 June 2014 and on 16 September 2014. Results of the studies and proposals for ensuring a sustainable BIPM Pension and Provident Fund, including the establishment of an advisory CIPM Sub-Committee/Supervisory Board of the BIPM Pension and Provident Fund will be presented later in the agenda. These issues will also be presented to the 25th CGPM in Draft Resolution C.

Another study has been commissioned to Van Breda International concerning trends and opportunities for cost containment of the BIPM Health Insurance. A first report has been presented to and discussed by the CIPM Sub-Committee on the PF & HI in its meeting on 16 June 2014. A further study is planned.

- 11.3. The BIPM has also commissioned a comparison study with respect to salary levels and related conditions of employment to the International Service for Remunerations and Pensions (SIRP). The report of this study is now being examined and discussed by the CIPM *ad hoc* Working Group on Conditions of Employment. An up-date will be presented.
- 11.4. The 2013 Financial Statements of the BIPM and the 2013 Financial Statements of the BIPM Pension and Provident Fund have been audited and approved by KPMG in accordance with International Public Sector Accounting Standards (IPSAS).

On the basis of the auditor's reports, the CIPM has approved the Financial Statements of the BIPM and the BIPM Pension and Provident Fund by correspondence, dated 14 June 2014. The CIPM is now asked to discharge the Director of the BIPM from all liabilities in respect to his administration of the BIPM Financial Statements and the BIPM Pension and Provident Fund for the 2013 financial period.

The Director of the BIPM and the Finance Administrator of the BIPM met the Chairman of the CIPM Sub-Committee on Finance, Dr Brian Bowsher, to discuss the budget and financial proposals to be presented to the CGPM at its 25th meeting.

A report will be presented later in the agenda.

- 11.5. At the request of members of the AHWG the BIPM has drafted a procedure for the election of a “CGPM” Committee for Election of CIPM Members, a role that is currently fulfilled by the AHWG during the transitional period.

The draft has been presented to the AHWG for their consideration.

- 11.6. As part of the efforts to improve the visibility of the BIPM as a lean, flexible and up-to-date leader in defining and realizing a credible and reliable global measurement system, a new BIPM website and logo has been launched.

**12. Management Review of the BIPM Quality Management System (QMSR) and the BIPM Occupational Health and Safety Management System (OHSMSR)**

- 12.1. The annual Management Review of the BIPM Quality Management System (QMSR) took place on 2 October 2014. This meeting was attended by the CIPM Secretary.

Actions agreed during the management review in October 2013 have been implemented.

The QMS is now well established; unnecessary duplications have been removed, while all documents, reports and information are accessible and retrievable via the BIPM intranet.

Internal and external on-site peer reviews are being carried out. A few minor non-compliances with the ISO/IEC 17025:2005 and the ISO Guide 34:2009 have been found and addressed.

A new initiative is to involve a BIPM scientist from a different BIPM Department in the internal audits. This has been done twice so far, and works well; the participation is appreciated by both the Department being audited and by the scientists taking part in the audits.

Customer satisfaction forms are now systematically issued together with the measurement certificates and reports, and returns are actively pursued. The feedback has increased very significantly and shows a very satisfactory picture.

Further improvements will be implemented in the administrative, purchasing area by installing new hardware and software, compatible with all other IT systems in use at the BIPM, while also the overall management of these administrative systems will be further coordinated and streamlined.

As discussed earlier and agreed in the JCRB, a presentation of the BIPM QMS to the EURAMET TC-Q on 10-11 April 2014 was well received and appraised. Confidence in the QMS of the BIPM was expressed and minuted.

- 12.2. The annual Management Review of the BIPM Occupational Health and Safety Management System (OHSMSR) took place on 2 October 2014. This meeting was also attended by the CIPM Secretary.

The OHSMS is now well in place. Actions agreed during the Management Review in October 2013 have been implemented or are in a final phase of implementation. Audits are being carried out regularly and regular awareness activities will be undertaken, for example with respect to electrical safety.

To further improve safety and security, the BIPM will install electronic admission systems for entering the laboratories. Inter-lock sliding door systems will be installed where required, which will operate in the event of a fire. Additional contamination detectors have been installed in the IR laboratory.

Additional administrative and management safety measures will be implemented to protect isolated, and lone workers late in the evening or at weekends.

An inventory of all existing alarm systems at the BIPM will be carried out to determine what is really needed, to simplify (if possible) current systems, and to prevent unnecessary false alarms.

No serious accidents took place over the reporting period. Accidents that occur when staff are travelling to or from the BIPM are covered by the Health Insurance, and are therefore also counted as “work accidents”.

## LISTE DES SIGLES UTILISÉS DANS LE PRÉSENT VOLUME / ACRONYMS USED IN THE PRESENT VOLUME

ACS	American Chemical Society
AFRIMETS	Intra-Africa Metrology System / Système intra-africain de métrologie
AHWG	<i>ad hoc</i> Working Group on the role, mission, objectives, long-term financial stability, strategic direction and governance of the BIPM / Groupe de travail <i>ad hoc</i> sur le rôle, la mission, les objectifs, la stabilité financière à long terme, la direction stratégique et la gouvernance du BIPM
AOS	<i>Astronomiczne Obserwatorium Szerokościowe</i> (Pologne / Poland)
APMP	Asia Pacific Metrology Programme
BAWG	CCQM Bioanalysis Working Group
BIML	Bureau international de métrologie légale / International Bureau of Legal Metrology
BIPM	Bureau international des poids et mesures / International Bureau of Weights and Measures
CAM	Commission Assurance-Maladie / Health Insurance Commission
CC	Comité consultatif du CIPM / Consultative Committee of the CIPM
CCAUV	Comité consultatif de l'acoustique, des ultrasons et des vibrations / Consultative Committee for Acoustics, Ultrasound and Vibration
CCE	Commission des conditions d'emploi / Commission for Conditions of Employment
CCEM	Comité consultatif d'électricité et magnétisme / Consultative Committee for Electricity and Magnetism
CCL	Comité consultatif des longueurs / Consultative Committee for Length
CCM	Comité consultatif pour la masse et les grandeurs apparentées / Consultative Committee for Mass and Related Quantities
CCNUCC	Convention-cadre des Nations Unies sur les changements climatiques
CCPR	Comité consultatif de photométrie et radiométrie / Consultative Committee for Photometry and Radiometry
CCQM	Comité consultatif pour la quantité de matière : métrologie en chimie et biologie / Consultative Committee for Amount of Substance: Metrology in Chemistry and Biology
CCRI	Comité consultatif des rayonnements ionisants / Consultative Committee for Ionizing Radiation
CCT	Comité consultatif de thermométrie / Consultative Committee for Thermometry
CCTF	Comité consultatif du temps et des fréquences / Consultative Committee for Time and Frequency
CCU	Comité consultatif des unités / Consultative Committee for Units
CENAM	<i>Centro Nacional de Metrología</i> (Mexique / Mexico)
CGPM	Conférence générale des poids et mesures / General Conference on Weights and Measures
CIE	Commission internationale de l'éclairage / International Commission on Illumination



CIMO	Commission for Instruments and Methods of Observations of the World Meteorological Organization / Commission des instruments et des méthodes d'observation de l'Organisation météorologique mondiale
CIPM	Comité international des poids et mesures / International Committee for Weights and Measures
CIPM MRA	CIPM Mutual Recognition Arrangement / Arrangement de reconnaissance mutuelle du CIPM
CMC	Calibration and Measurement Capability / Aptitude en matière de mesures et d'étalonnages
CMI	Czech Metrology Institute (République tchèque / Czech Republic)
CMS/ITRI	ITRI Center for Measurement Standards (Taïpei chinois / Chinese Taipei)
CODATA	Committee on Data for Science and Technology
CODATA TGFC	CODATA Task Group on Fundamental Constants
COOMET	Euro-Asian Cooperation of National Metrological Institutions
COSQC	Iraq Central Organization for Standardization and Quality Control
DCMAS	Network on Metrology, Accreditation and Standardization for Developing Countries / Réseau pour la coordination de l'assistance aux pays en voie de développement dans les domaines de la métrologie, de l'accréditation et de la normalisation
DI	Designated institute
DMDM	Directorate of Measures and Precious Metals (Serbie / Serbia)
EAWG	CCQM Working Group on Electrochemical Analysis
ERMS	Ensemble of reference mass standards
EURAMET	European Association of National Metrology Institutes
GCC	Gulf Cooperation Council
GNSS	Global Navigation Satellite Systems
GPS PPP	Global Positioning System Precise Point Positioning / Technique de positionnement précis du GPS
GSO	GCC Standardization Organization
GULFMET	Gulf Association for Metrology
GUM	Guide pour l'expression de l'incertitude de mesure / Guide to the Expression of Uncertainty in Measurement
GUM	Central Office of Measures (Pologne / Poland)
HMI/FSB-LPM	Croatian Metrology Institute/FSB - Laboratory for Testing of Mechanical Properties (Croatie / Croatia)
HSA	Health Sciences Authority (Singapour / Singapore)
IAAC	Inter American Accreditation Cooperation
IAC	International Avogadro Coordination / Projet de collaboration internationale sur la constante d'Avogadro
IAWG	CCQM Working Group on Inorganic Analysis
IAU	International Astronomical Union
IEC	International Electrotechnical Commission / Commission électrotechnique internationale

IFCC	International Federation of Clinical Chemistry and Laboratory Medicine / Fédération internationale de chimie clinique et de médecine de laboratoire
ILAC	International Laboratory Accreditation Cooperation
ILNAS	Institut luxembourgeois de la normalisation, de l'accréditation, de la sécurité et qualité des produits et services / Luxembourg Institute for Standardization, Accreditation, Security and Quality of Products and Services (Luxembourg)
INMETRO	<i>Instituto Nacional de Metrologia, Qualidade e Tecnologia</i> (Brésil / Brazil)
INRIM	<i>Istituto Nazionale di Ricerca Metrologica</i> (Italie / Italy)
INTI	<i>Instituto Nacional de Tecnología Industrial</i> (Argentine / Argentina)
IPK	International prototype of the kilogram
IPSAS	International Public Sector Accounting Standards
ISIRI	Institute of Standards and Industrial Research of Iran
ISO	Organisation internationale de normalisation / International Organization for Standardization
ISO CASCO	ISO Committee on Conformity Assessment / Comité pour l'évaluation de la conformité de l'ISO
ISO REMCO	ISO Committee on reference materials / Comité pour les matériaux de référence de l'ISO
ISRP	International Service for Remunerations and Pensions
IUPAC	International Union of Pure and Applied Chemistry / Union internationale de chimie pure et appliquée
IVD	<i>in vitro</i> diagnostics
JCGM	Joint Committee for Guides in Metrology / Comité commun pour les guides en métrologie
JCRB	Joint Committee of the Regional Metrology Organizations and the BIPM / Comité mixte des organisations régionales de métrologie et du BIPM
JCTLM	Joint Committee for Traceability in Laboratory Medicine / Comité commun pour la traçabilité en médecine de laboratoire
JILA	Joint Institute of the University of Colorado and the NIST (États-Unis d'Amérique / United States of America)
JV	Justervesenet (Norvège / Norway)
KazInMetr	Kazakhstan Institute of Metrology (Kazakhstan)
KCDB	BIPM Key Comparison Database / Base de données du BIPM sur les comparaisons clés
KCWG	Working Group for Key Comparisons
KEBS	Kenya Bureau of Standards (Kénya / Kenya)
KRISS	Korea Research Institute for Standards and Science (République de Corée / Republic of Korea)
LNE	Laboratoire national de métrologie et d'essais (France)
LNE-IRSN	Laboratoire national de métrologie et d'essais – Institut de radioprotection et de sûreté nucléaire (France)
LNE-SYRTE	Laboratoire national de métrologie et d'essais – Système de Références Temps-Espace (France)

MASM	Mongolian Agency for Standardization and Metrology (Mongolie / Mongolia)
METAS	Institut fédéral de métrologie / Federal Institute of Metrology (Suisse / Switzerland)
MIRS	Metrology Institute of the Republic of Slovenia (Slovénie / Slovenia)
MKEH	Hungarian Trade Licensing Office (Hongrie / Hungary)
NCSLI	National Conference of Standards Laboratories International
NIM	National Institute of Metrology (Chine / China)
NIMT	National Institute of Metrology (Thaïlande / Thailand)
NIST	National Institute of Standards and Technology (États-Unis d'Amérique / United States of America)
NMI	National Metrology Institute
NMIA	National Measurement Institute, Australia (Australie / Australia)
NMISA	National Metrology Institute of South Africa (Afrique du sud / South Africa)
NMIJ	National Metrology Institute of Japan (Japon / Japan)
NMIJ/AIST	National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (Japon / Japan)
NMR	Nuclear Magnetic Resonance
NPL	National Physical Laboratory (Royaume-Uni de Grande-Bretagne et d'Irlande du Nord / UK)
NRC	National Research Council (Canada)
OHSMR	BIPM Occupation Health and Safety Management System
OIML	Organisation internationale de métrologie légale / International Organization of Legal Metrology
OMC	Organisation mondiale du commerce
OMM	Organisation météorologique mondiale
ONUDI	Organisation des Nations Unies pour le développement industriel
PET	Positron emission tomography
PMOD/WRC	Physikalisch-Meteorologisches Observatorium Davos/World Radiometric Reference / Observatoire physico-météorologique de Davos/Centre mondial du rayonnement
PPRF	Pension and Provident Reserve Fund
PTB	<i>Physikalisch-Technische Bundesanstalt</i> (Allemagne / Germany)
QMS	Quality Management System
QMSR	Management Review of the BIPM Quality Management System
RMO	Regional Metrology Organization
RRI	BIPM Regulations, Rules and Instructions
SB	Supervisory Board
SI	Système international d'unités / International System of Units
SIM	Inter-American Metrology System
SIR	Système international de référence / International Reference System
SIRP	Service international des rémunérations et des pensions / International Service for Remunerations and Pensions
SIRTI	Transfer Instrument of the International Reference System

SMU	Slovenský Metrologický Ústav / Slovak Institute of Metrology (Slovaquie / Slovakia)
SPWG	Working Group on Strategic Planning
SRI	Statut, Règlement et Instructions applicables aux membres du personnel du BIPM
SSMO	Sudanese Standards and Metrology Organization (Soudan / Sudan)
TAI	Temps atomique international / International Atomic Time
TBT	Technical Barriers to Trade
UAI	Union astronomique internationale
UIT	Union internationale des télécommunications
UME	National Metrology Institute / <i>TÜBİTAK Ulusal Metroloji Enstitüsü</i> (Turquie / Turkey)
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization / Organisation des Nations Unies pour l'éducation, la science et la culture
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
URSI	Union radioscopique internationale
UTC	Temps universel coordonné / Coordinated Universal Time
UTCr	UTC rapide / rapid UTC
VAMAS	Versailles Project on Advanced Materials and Standards
VIM	Vocabulaire international de métrologie – Concepts fondamentaux et généraux et termes associés (3 <sup>e</sup> édition) / International Vocabulary of Metrology, Basic and General Concepts and Associated Terms (3rd edition)
WGs	Working Groups
WGATFT	CCTF Working Group on Coordination of the Development of Advanced Time and Frequency Transfer Techniques
WGFS	CCL-CCTF Frequency Standards Working Group
WGGNSS	CCTF Working Group on GNSS Time Transfer
WGTWSTFT	CCTF Working Group on Two-Way Satellite Time and Frequency Transfer
WMO	World Meteorological Organization
WTO	World Trade Organization
XPS	X-ray photoelectron spectroscopy