

**Bureau international des poids et mesures**

# **Comité international des poids et mesures**

100th meeting (May and October 2011)

### 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.

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## MEMBER STATES AND ASSOCIATES OF THE GENERAL CONFERENCE

as of 14 October 2011

### Member States

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

### Associates of the General Conference

Albania	Chinese Taipei
Bangladesh	Costa Rica
Belarus	Cuba
Bolivia (Plurinational State of)	Ecuador
Bosnia and Herzegovina	Estonia
CARICOM	Georgia

**Associates of the General Conference (cont.)**

Ghana	Paraguay
Hong Kong, China	Peru
Jamaica	Philippines
Latvia	Seychelles
Lithuania	Slovenia
Macedonia (the FYR of)	Sri Lanka
Malta	Tunisia
Mauritius	Ukraine
Moldova (Republic of)	Viet Nam
Montenegro	Zambia
Panama	Zimbabwe

## THE BIPM

The International Bureau of Weights and Measures (BIPM) was created by the Metre Convention signed in Paris on 20 May 1875 by seventeen States during the final session of the diplomatic Conference of the Metre. This Convention was amended in 1921.

The BIPM has its headquarters near Paris, in the grounds (43 520 m<sup>2</sup>) of the Pavillon de Breteuil (Parc de Saint-Cloud) placed at its disposal by the French Government; its upkeep is financed jointly by the Member States.

The task of the BIPM is to ensure world-wide uniformity of measurement; its function is thus to:

- establish fundamental standards and scales for the measurement of a number of principal physical quantities and maintain the international prototypes;
- carry out comparisons of national and international standards based on unique international reference facilities for its Members;
- ensure the coordination of the development of appropriate measurement techniques;
- carry out and coordinate measurements of the fundamental physical constants relevant to these activities.

The BIPM operates under the exclusive direction and supervision of the International Committee for Weights and Measures (CIPM), which itself comes under the authority of the General Conference on Weights and Measures (CGPM) and reports to it on the work accomplished by the BIPM. The CIPM has eighteen members each being of different nationality, and at present it meets every year. The CIPM submits to the Governments of the Member States an annual report on the administrative and financial situation of the BIPM.

The CGPM is made up of delegates from all Member States and at present meets every four years. Its mission is to:

- discuss and initiate the arrangements required to ensure the propagation and improvement of the International System of Units (SI), which is the modern form of the metric system;
- confirm the results of new fundamental metrological determinations and various scientific resolutions of international scope;
- take all major decisions concerning the finance, organization and development of the BIPM.

The activities of the BIPM, which in the beginning were limited to measurements of length and mass, and to metrological studies in relation to these quantities, have been extended to standards of measurement of electricity (1927), photometry and radiometry (1937), ionizing radiation (1960), time scales (1988) and to chemistry (2000). To this end the original laboratories, built in 1876-1878, were enlarged in 1929; new buildings were constructed in 1963-1964 for the ionizing radiation laboratories, in 1984 for the laser work and in 1988 for a library and offices. In 2001 a new building for the workshop, offices and meeting rooms was opened.

Some forty-five physicists and technicians work in the BIPM laboratories. They mainly conduct international comparisons of realizations of units, calibrations of standards and metrological research. An annual report, the *Director's Report on the Activity and Management of the International Bureau of Weights and Measures*, gives details of the work in progress.

Following the extension of the work entrusted to the BIPM in 1927, the CIPM has set up bodies, known as Consultative Committees, whose function is to provide it with information on matters that it refers to them for study and advice. These Consultative Committees, which may form temporary or permanent working groups to study special topics, are responsible for coordinating the international work carried out in their respective fields and for proposing recommendations to the CIPM concerning units.

The Consultative Committees have common regulations (*Rules of procedure for the Consultative Committees (CCs) created by the CIPM, CC working groups and CC workshops*, 2009, CIPM-D-01). They meet at irregular intervals. The president of each Consultative Committee is designated by the CIPM and is normally a member of the CIPM. The members of the Consultative Committees are metrology laboratories and specialized institutes, agreed by the CIPM, which send delegates of their choice. In addition, there are individual members appointed by the CIPM, and a representative of the BIPM (Criteria for membership of Consultative Committees, *BIPM Proc.-Verb. Com. Int. Poids et Mesures*, 1996, **64**, 124).

At present, there are ten such committees:

1. The Consultative Committee for Electricity and Magnetism (CEEM), new name given in 1997 to the Consultative Committee for Electricity (CCE) set up in 1927.
2. The Consultative Committee for Photometry and Radiometry (CCPR), new name given in 1971 to the Consultative Committee for Photometry (CCP) set up in 1933 (between 1930 and 1933 the CCE dealt with matters concerning photometry).

3. The Consultative Committee for Thermometry (CCT), set up in 1937.
4. The Consultative Committee for Length (CCL), new name given in 1997 to the Consultative Committee for the Definition of the Metre (CCDM), set up in 1952.
5. The Consultative Committee for Time and Frequency (CCTF), new name given in 1997 to the Consultative Committee for the Definition of the Second (CCDS) set up in 1956.
6. The Consultative Committee for Ionizing Radiation (CCRI), new name given in 1997 to the Consultative Committee for Standards of Ionizing Radiation (CCEMRI) set up in 1958 (in 1969 this committee established four sections: Section I (X- and  $\gamma$ -rays, charged particles), Section II (Measurement of radionuclides), Section III (Neutron measurements), Section IV ( $\alpha$ -energy standards); in 1975 this last section was dissolved and Section II was made responsible for its field of activity).
7. The Consultative Committee for Units (CCU), set up in 1964 (this committee replaced the “Commission for the System of Units” set up by the CIPM in 1954).
8. The Consultative Committee for Mass and Related Quantities (CCM), set up in 1980.
9. The Consultative Committee for Amount of Substance: Metrology in chemistry (CCQM), set up in 1993.
10. The Consultative Committee for Acoustics, Ultrasound and Vibration (CCAUV), set up in 1999.

The proceedings of the meetings of the General Conference and the CIPM are published in the following series:

- *Comptes rendus des séances de la Conférence générale des poids et mesures;*
- *Procès-verbaux des séances du Comité international des poids et mesures.*

The CIPM decided in 2003 that the reports of meetings of the Consultative Committees should no longer be printed, but would be published on the BIPM website, in their original language.

The BIPM also publishes monographs on special metrological subjects and, under the title *The International System of Units (SI)*, a brochure, periodically updated, in which are collected all the decisions and recommendations concerning units.

The collection of the *Travaux et Mémoires du Bureau International des Poids et Mesures* (22 volumes published between 1881 and 1966) and the *Recueil de Travaux du Bureau International des Poids et Mesures* (11 volumes published between 1966 and 1988) ceased by a decision of the CIPM.

The scientific work of the BIPM is published in the open scientific literature and an annual list of publications appears in the *Director's Report on the Activity and Management of the International Bureau of Weights and Measures*.

Since 1965 *Metrologia*, an international journal published under the auspices of the CIPM, has printed articles dealing with scientific metrology, improvements in methods of measurement, work on standards and units, as well as reports concerning the activities, decisions and recommendations of the BIPM.

In 1999, the CIPM established a Mutual Recognition Arrangement of national measurement standards and of calibration and measurement certificates issued by National Metrology Institutes (CIPM MRA). Signature of this Arrangement commits NMIs to:

- accept the process specified in the CIPM MRA for establishing a data base, which is maintained by the BIPM and publicly available on the Web;
- recognize the results of comparisons published in the database;
- recognize the calibration and measurement capabilities of other participating NMIs as stated in the database.

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

as of 14 October 2011

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on 14 October 2011

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**Emeritus directors:** Dr T.J. Quinn, Prof. A.J. Wallard

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1 Also Chemistry

2 Under the invalidity scheme

3 Also Publications

4 Also General Services

International Committee  
for Weights and Measures

**Proceedings of Session I  
of the 100th meeting**

(24 May 2011)

**Agenda**

1. Opening of the meeting; quorum; agenda
2. Confirmation of the minutes of the 2010 meeting
3. Report of the Secretary and activities of the bureau of the CIPM
4. Membership of the CIPM and other matters
5. BIPM matters
6. States Parties to the Metre Convention and Associates of the CGPM
7. Preparation for the meeting of NMI Directors on 25 May 2011
8. Preparation for the 24th meeting of the CGPM
9. Report on the present status of the CIPM MRA
10. International co-operation
11. Any other business
12. Date of next meeting

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

The International Committee for Weights and Measures (CIPM) held Session I of its 100th meeting on Tuesday 24 May 2011 at the Pavillon de Breteuil, Sèvres.

Present: S. Bennett, Y. Duan, L. Énard, E.O. Göbel, B. Inglis, L.K. Issaev, R. Kaarls, W.E. May, J.W. McLaren, H.O. Nava-Jaimes, W. Schwitz, M. Tanaka, H. Uğur, J. Valdés, as well as M. Kühne, Director of the BIPM. Apologies were received from K. Carneiro, K.H. Chung, F. Hengstberger and A. Sacconi.

Also attending: F. Joly (Head of Communication and Information Section); B. Perent (Financial and Administrative Director of the BIPM); C. Planche (Communication and Information Section); T.J. Quinn (Emeritus Director of the BIPM) and R. Sitton (Communication and Information Section). Also in attendance for parts of the meeting: I. Andernack (Finance, Administration and General Services Department); S. Arlen (Legal Adviser of the BIPM); and A. Henson (International Liaison Officer).

Dr Inglis, President of the CIPM, opened Session I of the 100th meeting of the CIPM. With 14 out of 18 members present the quorum was satisfied according to Article 12 of the Regulations annexed to the Metre Convention.

Dr Inglis noted with sadness the announcement of the death of Dr Sigfrido Leschiutta, a member of the CIPM from 1997 to 2006 and President of the Consultative Committee for Time and Frequency (CCTF) from 1997 to 2006. A minute's silence was observed in his memory.

There was one change to the agenda. The discussion on third party funding of the BIPM was delayed until Session II of the 100th meeting of the CIPM in October 2011.

Agenda item 4 on Preparations for the appointment of the next Director of the BIPM was held in a closed session.

## **2. CONFIRMATION OF THE MINUTES OF THE 2010 MEETING**

The minutes of the 99th meeting (2010) were accepted with one comment. The date of the meeting of the Consultative Committee for Thermometry (CCT) is 21–25 May 2012.

## **3. REPORT OF THE SECRETARY AND ACTIVITIES OF THE BUREAU OF THE CIPM**

### **3.1 Meetings of the bureau of the CIPM**

The bureau of the CIPM (“the bureau”) has met on two occasions since the last meeting of the CIPM: 7–8 March 2011 and 23 May 2011. These meetings took place at the International Bureau of Weights and Measures (BIPM) Headquarters in Sèvres. The Secretary made additional visits to the BIPM Headquarters between October 2010 and May 2011.

The bureau held its regular liaison meeting with the International Organization of Legal Metrology (OIML) and the International Laboratory Accreditation Cooperation (ILAC) in March 2011. Regrettably, the Secretary General of the International Organization for Standardization (ISO) was not able to attend the BIPM, ILAC, ISO and OIML meeting.

On the occasion of the March 2011 CIPM bureau meeting, the bureau met with the incoming president of the International Committee for Legal Metrology (CIML), Dr Mason, while the CIPM President also held a short meeting with Dr Bock, director of the Federal Office of Metrology (METAS), Switzerland. In March 2011 the CIPM President also visited the National Physical Laboratory (NPL), United Kingdom of Great Britain and Northern Ireland, and met with its Director, Dr Bowsher and again with Dr Mason.

The Director of the BIPM visited the US State Department and the UK National Measurement Office (NMO) in February 2011 and the German Ministry of Economics in March 2011.

### **3.2 CIPM Membership**

There have been no resignations from the CIPM since its last meeting in October 2010.

### **3.3 States Parties to the Metre Convention (Member States) and Associates of the CGPM (Associates)**

Saudi Arabia became a Member State on 11 February 2011, bringing the total number of Member States to 55. There has also been an increase in the number of Associates to 33 with the association of Mauritius on 5 October 2010, Zambia on 10 December 2010 and Bosnia and Herzegovina on 24 May 2011.

### **3.4 Outreach**

As reported in 2010 the secretariat of the Joint Committee on Coordination of Assistance to Developing Countries in Metrology, Accreditation and Standardization (JCDCMAS) moved from the BIPM to the International Electrotechnical Commission (IEC). The Joint Committee was renamed as the DCMAS Network, while the terms of reference of the DCMAS Network have been adapted. The first meeting of the DCMAS Network was held on 14 April 2011 in Geneva, Switzerland. The BIPM was represented by Mr Altan, Executive Secretary of the Joint Committee of the Regional Metrology Organizations and the BIPM (JCRB).

### **3.5 Member States in financial arrears for more than three years**

Four States continue to be in financial arrears for more than three years: Cameroon, the Dominican Republic, the Islamic Republic of Iran and the Democratic People's Republic of Korea. A number of actions undertaken since the last meeting of the CIPM will be reported later in the meeting. Many renewed and intensified contacts took place between the governments of these States through their Embassies or Representations in Paris as well as a number of personal contacts. *Notes Verbales* were sent to the Governments of these four States pursuant to Resolution 8 adopted by the General Conference on Weights and Measures (CGPM) at its 23rd meeting in 2007. Each of the States concerned was notified that a draft resolution from the CIPM recommending the CGPM to take a decision with regard to its

exclusion at its next meeting was included in the text of the Convocation of the 24th meeting of the CGPM sent in December 2010 to Member States and was again invited to negotiate a rescheduling agreement for the settlement of its arrears.

### **3.6 BIPM administrative and staff matters**

- 3.6.1 At each meeting, the members of the bureau receive reports on the financial status of the BIPM throughout the year. The bureau received a number of presentations and reports from the Financial and Administrative Director on the implementation of an accrual basis of accounting. Further details will be provided later in the meeting of the CIPM.
- 3.6.2 A long discussion took place about the most effective and informative way of presenting the budget related to the Programme of Work for the period 2013 to 2016 to the CGPM and to Governments. As a result, a document with a number of different funding scenarios is to be presented for discussion.
- 3.6.3 As the current Director of the BIPM will retire in March 2014, the bureau discussed the procedure and the practical arrangements for appointing his successor. This will be discussed later in a closed session.

### **3.7 The CIPM MRA**

On 12 November 2010 the National Metrology Institute (NMI) of the Seychelles signed the CIPM MRA, followed by the NMIs of Zimbabwe on 14 January 2011, Zambia on 3 February 2011, Mauritius on 9 March 2011 and Bangladesh on 25 March 2011, bringing the number of signatories of the CIPM MRA to 86 (50 States Parties to the Metre Convention, 33 Associate States and 3 International Organizations).

A report on JCRB activities will be presented to the CIPM later in the agenda.



### **3.8 Relations with other bodies**

- 3.8.1 Co-operation with the OIML concerning a possible "rapprochement" is continuing,
- 3.8.2 Co-operation with the ILAC is continuing in a satisfactory way. An ILAC draft document on the accreditation of NMIs is still in preparation and under discussion, as are a number of other ILAC documents addressing traceability and measurement uncertainty issues.
- 3.8.3 New and challenging areas of metrology, such as climate change, health care, pharmacopoeia, physiology, forensics, micro-biology and nano-technology are coming under increasing interest by other intergovernmental organizations and international bodies for potential co-operation with the BIPM and the Consultative Committees.
- 3.8.4 On 6–7 April 2011 the workshop “Role for reliable traceable microbiological measurements to ensure food quality and safety” was held with representatives from the microbial testing community. This included participants from the Asia-Pacific Economic Cooperation (APEC), regulators, such as the Food and Drug Administration (FDA), standardization bodies, multinational food industries, the International Dairy Federation (IDF) and testing laboratories. A clear need exists to include metrological principles, for example traceability and measurement uncertainty. A Consultative Committee for Amount of Substance (CCQM) steering committee will be created to develop suggestions for the follow-up to the workshop.
- 3.8.5 The BIPM-WMO Workshop on Measurement Challenges for Global Observation Systems for Climate Change Monitoring: Traceability, Stability and Uncertainty, held in March-April 2010 at the World Meteorological Organization (WMO) premises in Geneva, Switzerland, is to be followed up by a joint BIPM-WMO working group to develop programmes for further co-operation.

### **3.9 Preparations for the 24th meeting of the CGPM**

- 3.9.1 The CIPM bureau has been heavily involved in preparations for the upcoming meeting of the CGPM in October 2011. The bureau asked for significant reductions in the proposed budget and therefore the proposed dotation so as to trim the cost of the Programme of Work to take into account comments from the NMI Directors, as expressed during their

previous meeting on 2-3 June 2010, while trying to maintain the scientific content discussed by the CIPM in its previous meeting. As a result, a document on the BIPM Programme of Work 2013–2016 under various funding scenarios will be presented for discussion as mentioned in section 3.6.2.

3.9.2 The bureau discussed the issue of possible improvements in the governance structure of the BIPM.

3.9.3 The bureau discussed a new draft Resolution concerning the name of the Intergovernmental Organization in order to distinguish between the BIPM as the Office with its laboratories in Sèvres, and the organization as a whole.

Dr Inglis thanked Dr Kaarls for his report and invited questions from the CIPM members.

Prof. Kühne commented that he gave a presentation in Vienna, Austria, at the opening of a new laboratory building for the Austrian National Metrology Institute (BEV) on World Metrology Day. Dr Wielgosz gave a talk in Poland on this occasion on the theme of the International Year of Chemistry. Dr Issaev commented that there had been much activity in the Russian Federation in connection with World Metrology Day, with 10-12 journals publishing on the subject.

#### **4. MEMBERSHIP OF THE CIPM AND OTHER MATTERS**

Agenda item 4 was discussed in a closed session of the CIPM.

##### **4.1 Preparations for the appointment of the next Director of the BIPM**

This section of the meeting was held in a closed session. The current Director of the BIPM, Prof. Kühne, will reach retirement age in March 2014. The CIPM made the following decisions:

- (I) To appoint the next Director for a renewable five-year term at the beginning of 2013, initially into the position of Deputy Director and then Director designate, to allow a smooth transfer of directorship. This will also allow the new Director to be involved in the implementation of the outcome of the review of the role, mission and

long-term strategy of the BIPM, as well as in the formulation of the Programme of Work of the BIPM for the period 2017–2020.

- (II) That the search for the next Director should begin during the second half of 2011, so that the CIPM can make a final decision before mid-2012.
- (III) To set up a Search Committee, chaired by Dr May, Vice-President of the CIPM.
- (IV) That the CIPM bureau, with the support of a third person, will act as the Selecting Committee.
- (V) On a time schedule for the selection and appointment of the next BIPM Director and on the text of the vacancy notice (see Annex 1) which will be published widely in the international press and communicated to the Member States, Associates and NMI Directors in September 2011.

## **5. BIPM MATTERS**

### **5.1 “Rapport aux Gouvernements” for 2010**

This section of the agenda was brought forward from section 8 due to the attendance of the external auditor, to allow him to report on the audit of the 2009 and 2010 BIPM financial statements and the reviewing process related to the change in the BIPM accounting system from cash accounting to accrual accounting. The sections on the impact of the new date of the CIPM meetings on reports and Member States in financial arrears for more than three years have been brought forward and are included in section 5.

Mrs Perent presented the Annual report to the Governments of the High Contracting Parties on the administrative and financial situation of the International Bureau of Weights and Measures in 2010. This is the first time that the report is available in French and English. The BIPM’s transition from cash accounting to accrual accounting was completed for the 2010 BIPM financial statements.

At the end of the 2010 financial period (31 December 2010) the BIPM had assets of 63 million Euros, liabilities of 19 million Euros and net assets of 44 million Euros. The BIPM had current assets of 22.702 million Euros,

among which cash and cash equivalents for restricted use stood at 12.132 million Euros. Cash and cash equivalent, included for restricted use, comprise in particular 0.367 million Euros related to the Reserve Fund for Health Insurance to provide a guarantee for health insurance cover, 3.838 million Euros corresponding to 35 % of the dotation of the ensuing financial period set aside to provide for any fluctuations in payments of annual contributions from States Parties to the Metre Convention, and 3.557 million Euros in the Capital Investment Fund aimed at supporting the infrastructure of the BIPM, any other additional capital investment needed and any unexpected expenses. Non-current liabilities totalled 6.9 million Euros on 31 December 2010, up from 5.9 million Euros on 31 December 2009. These liabilities include non current employee benefits, i.e. health insurance and retirement indemnity provisions. Net assets totalled 43.896 million Euros on 31 December 2010 and 45.099 million Euros on 31 December 2009. The BIPM's total operating revenue was 12.451 million Euros in 2010 compared to 12.041 million Euros in 2009. Total operating expenses were 13.622 million Euros in 2010 and 12.021 million Euros in 2009. The result from operating activities was -1.171 million Euros in 2010 compared to 0.02 million Euros in 2009. Staff costs, primarily salaries, family and social allowances and changes in health insurance provision increased to 6.572 million Euros in 2010 from 5.137 million Euros in 2009. The budget outturn for 2010 was prepared under an accrual basis of accounting and adjusted for non cash items such as depreciation and amortization, change in provisions such as health insurance provision and annual leave provision, staff costs included in BIPM assets during the period, foreign currency conversion gains and losses, and loss on sale of tangible assets.

At the end of the 2010 financial period, the BIPM Pension and Provident Fund had total assets of 19 million Euros and total liabilities of 76.5 million Euros, resulting in negative net assets of 57.5 million Euros. The provisions for pension benefits have been estimated by an independent actuary and are based on a number of key assumptions including economic assumptions such as inflation, rate of return on assets, annual salary increase, contribution rate, demographic assumptions such as mortality tables, employee turnover rate, retirement age, and spouse or partner's age.

Dr Inglis raised the question on how the BIPM expects to cover the actuarial deficit in the pension fund. Mrs Perent recalled that the negative net assets should be covered in the long term as a result of the decisions taken by the CIPM in 2009 on the basis of the last actuarial study. She pointed out that

future actuarial liabilities are based on a number of assumptions, some of which were included in the last actuarial study which dated back to 2008. A number of assumptions are regularly reviewed such as the rate of return on assets which critically depends on the financial markets. The next actuarial study will be carried out in 2012–2013 to review the situation of the Pension Fund. Mrs Perent finally mentioned that there is indeed currently an actuarial deficit but pensions, at present, are duly served by the contributions.

Prof. Göbel pointed out the difference between the total liabilities and the total assets in the BIPM financial statements. Mrs Perent commented that the net value of the assets will decrease in the Programme of Work for 2013-2016 given the limited increase of the dotation expected to be voted by the CGPM at its next meeting that would not ensure maintenance of the level of the assets.

The external auditor was invited to present his audit report. He reported that he had carried out the audit of the 2009–2010 BIPM financial statements prepared according to the International Public Sector Accounting Standard (IPSAS), particularly regarding the switch from cash accounting to accrual accounting. The external auditor certified that the financial statements established and presented by the Director of the BIPM according to IPSAS give a true and fair view of the financial position of the BIPM, of its financial performance, its change in net assets, its cash flows and the budget outturn, except for the effect of the four following comments:

- The statement of changes in net assets is not available as at 31 December 2009: since the BIPM financial statements, historically presented using the cash accounting, have been prepared using an accrual basis of accounting starting on January 1st, 2009, the net result for 2008 was not available, which did not permit the preparation of the Statement of changes in net assets for 2009.
- The 2009 budget outturn has not been restated under IPSAS and is presented using the cash basis method of accounting, as it was approved by the CIPM in 2010.
- Since he did not attend the annual stocktaking for 2009 and 2010 periods, the auditor cannot give his opinion on inventories as at 31 December 2010 and 2009, which are accounted for € 594K and € 595K as at 31 December 2010 and 2009 respectively.
- For the first time as at December 31st, 2009, the BIPM valued in its accounts a piece of software dedicated to the International Atomic Time

calculation for an amount of € 1.433K. During the development phase, the BIPM internal control did not include monitoring on this specific project. Thus, capitalized costs have been estimated after the end of the project on a declarative basis.

The external auditor was very complimentary about the way in which the transition to IPSAS was achieved by the BIPM Finance, Administration and General Services Department.

Dr Inglis commented that the considerable achievements of the Finance, Administration and General Services Department staff should be recognized and that the CIPM should be made aware of the extent of the task involved in the switch from cash accounting to accrual accounting, because the migration process is extremely difficult to achieve. The fact that this was completed with only four comments from the auditor is even more remarkable. The whole process was successfully completed in a short timeframe and to a high standard.

Dr Kaarls asked if the issues raised in the four comments are transitional and when they would be resolved. The external auditor replied that indeed the first three of the comments will be resolved in future financial statements. The issue relating to internal control procedures for the time calculation software will persist because this is related to past accounts.

Dr Inglis stated that IPSAS reporting requires the production of rigorous and complex reports and pointed out that some other accounting standards accept a reduced level of reporting. He enquired whether the amount of effort required by the BIPM to produce its financial statements is essential or if it would be possible to work to a reduced level of reporting. The external auditor replied that for small private companies there is a lower level of reporting but the IPSAS standards used by the BIPM address the needs of the public sector. These organizations are usually very large. The work completed so far has applied an adequate level of the standard appropriate to the BIPM without too much narrative.

Dr Inglis reiterated that the BIPM should be clear and transparent in its accounting policies and should not spend too much time applying a maximum level of IPSAS if this is only required for larger organizations. The external auditor stated that a considerable amount of work is required when IPSAS is used for the first time, but time savings can be achieved in subsequent years.

Dr Inglis restated that on behalf of the CIPM he would like to recognize the huge effort made by the Finance and Administration Department staff members regarding the switch to IPSAS and his appreciation of the work involved. For one of the world's leading experts on IPSAS, to compliment the BIPM on its efforts is notable.

Prof. Uğur asked who made the assumptions in the financial statements regarding liabilities and how they are made. Mrs Perent replied that the financial statements include a number of valuations, including those related to health insurance provision, and they are based on the advice of an independent actuary. Some assumptions are made by studying historical health insurance data. Defined rules are used for aspects such as depreciation policy and practices and operation of the BIPM are reviewed internally. The assumptions are included in the notes to the financial statements.

Dr Schwitz asked how running costs are calculated for the BIPM. Mrs Perent replied that all staff members are required to report on activities related to the Programme of Work via timesheets. This will provide the required information although the calculation of detailed costings is in progress. Prof. Kühne commented that the new accounting policies improve transparency for the States Parties to the Metre Convention but that they increase the workload for the BIPM. Dr Inglis noted that the value added by completing timesheets is not always justified in terms of the effort needed and stated that a balance is required. Mrs Perent stated that timesheets are necessary to report on the financial basis of projects and to estimate resources devoted to certain activities, as required in particular for third party funding.

Dr Kaarls stated that the BIPM needs a procedure for answering questions about return on investments. Mrs Perent replied that return on investments applies to private companies but not to the BIPM which is an intergovernmental organization. Dr Kaarls accepted this but reiterated that governments may want to know what they “get for their money”.

Dr Schwitz suggested that a core statement is needed that gives details of how much various activities cost. Dr Quinn commented that according to the Metre Convention the BIPM operates under the supervision of the CIPM. He expressed concern that the BIPM could end up operating under the authority of an auditor. He also cautioned that timesheets can have a negative impact on morale.

Prof. Uğur asked how it would be possible to compare IPSAS financial statements with previous statements that were prepared on a cash accounting basis. Dr May commented that it was not useful to assess the value of the BIPM only in financial terms. Prof. Uğur continued that many people do not understand the value and benefits of metrology and look to financial value.

## **5.2 Quietus for 2009 and 2010**

After establishment and presentation of the 2009 and 2010 BIPM audited financial statements and of the auditor's report, Mrs Perent drew the attention of the CIPM to the page of the auditor's report for 2010, confirming the accounts presented in the *Annual report to Governments*, and the CIPM unanimously gave quietus to the Director and the Financial and Administrative Director of the BIPM for the 2009 and 2010 financial statements. The CIPM discharges the Director of the BIPM from all liability in respect of his administration for the 2009 and 2010 financial periods.

Mrs Perent asked for the approval of the 2009 and 2010 BIPM financial statements on an accrual basis as the 2009 financial statements were restated according to IPSAS and audited by the external auditor under an accrual basis. The CIPM unanimously approved the 2009 and 2010 BIPM financial statements under an accrual basis of accounting.

The CIPM also decided to transfer to "Other reserves" the net result for the 2010 period. It is agreed that the CIPM will decide on the transfer of the net result on a yearly basis.

## **5.3 Impact of new date of the CIPM meetings on reports**

The *Annual Report to Governments* is now produced in both French and English. It includes information on the BIPM's activities and the BIPM financial statements as well as the BIPM pension and provident fund financial statements. The *Director's Report* traditionally covers the period from July to June and is approved by the CIPM at its meeting every October. Therefore, it is suggested that the dates of the *Director's Report* change to cover to a calendar year, in line with the *Annual Report to Governments*, bringing both reports into phase. The possibility of merging the *Annual Report to Governments* and the *Director's Report* was discussed.



It was suggested that the next *Director's Report* should cover the period from 1 July 2010 to 31 December 2011. Following reports would then be aligned with the calendar year. This suggestion was approved by the CIPM.

#### **5.4 Member States in financial arrears for more than three years**

Four States continue to be in financial arrears for more than three years, they are: Cameroon, the Dominican Republic, the Islamic Republic of Iran and the Democratic People's Republic of Korea. Contact has been maintained with the four States. The following is a summary of what has happened since the 99th meeting of the CIPM in October 2010.

A *Note Verbale* was sent to each of the four States in financial arrears in February 2011 informing it that a draft resolution from the CIPM recommending the CGPM to take a decision with regard to its exclusion at its next meeting was included in the text of the Convocation of the 24th meeting of the CGPM, sent in December 2010 to Member States in accordance with Resolution 8 adopted by the CGPM at its 23rd meeting in 2007, and inviting it to negotiate a rescheduling agreement for the settlement of the arrears.

The BIPM has received about 11 500 Euros from Cameroon, which owes a total of about 670 000 Euros. The BIPM has acknowledged receipt of this amount and has asked for clarification from Cameroon on the context within which this payment was made as no rescheduling agreement has been concluded. No reply has been received so far.

Prof. Wallard, Prof. Kühne, Mrs Perent and Ms Arlen met in October 2010 with a Minister Councillor from the Embassy of the Dominican Republic in Paris who commented that the Dominican Republic wishes to settle its arrears. In January 2011, a meeting was held with the Ambassador for the Dominican Republic and the Ambassador announced that a rescheduling plan would be submitted to the BIPM by the Ministry of Economy of the Dominican Republic. There have been many meetings and contacts with representatives from the Dominican Republic but no agreement has yet been reached.

The BIPM was informed that it is the wish of the Islamic Republic of Iran to remain as a Member State and Prof. Kühne and Mrs Perent met with a Councillor from the Embassy of the Islamic Republic of Iran in February 2011. A message was received from the General Director of Public and

international relations at the Institute of Standards and Industrial Research of Iran, (ISIRI), inviting the BIPM Director to visit ISIRI and discuss the issue. The General Director of ISIRI has, in return, been invited to the BIPM.

No communication was received from the Democratic People's Republic of Korea further to the *Note Verbale* sent by the BIPM in February 2011.

## **6. STATES PARTIES TO THE METRE CONVENTION (MEMBER STATES) AND ASSOCIATES OF THE CGPM (ASSOCIATES)**

### **6.1 New Member States and Associates since the last meeting of the CIPM**

The following changes in Membership of the BIPM and Associates of the CGPM have occurred since the 99th meeting of the CIPM:

- the accession to the Metre Convention of Saudi Arabia on 11 February 2011;
- the association of Zambia on 10 December 2010 ;
- the association of Bosnia and Herzegovina on 24 May 2011.

As of 24 May 2011 there were 55 Member States and 33 Associates of the CGPM.

### **6.2 Prospective Member States and Associates**

Mr Henson gave a summary of the ongoing work to attract new Member States and Associates.

Work is ongoing in Africa. A Metrology summer school was held by the Inter-Africa Metrology System (AFRIMETS) in Nairobi, Kenya, in February 2011 which was attended by Prof. Kühne, Dr Davis and Mr Henson. The summer school was funded by the United Nations Industrial Development Organization (UNIDO). An approach has been made to the BIPM from Namibia expressing an interest in its activities. Most approaches are from States that are considering becoming Associates of the CGPM rather than States Parties to the Metre Convention. Technical assistance projects are a useful way of helping States to become Associates of the CGPM, with initial subscriptions being paid from the technical assistance budgets. Such

transient arrangements must allow establishing a sustainable situation so that payments can continue after technical assistance ceases.

In the Middle East, a series of exchanges have taken place with a number of States including, but not limited to, Yemen, Qatar, Oman and Kuwait. Discussions with Syria are ongoing, with its subscription being funded through a technical assistance project.

In Europe, the Association of Bosnia and Herzegovina on 24 May 2011 is a positive move. The COOMET General Assembly highlighted the challenges in the region. Belarus and Ukraine have expressed interest in moving from the status of Associate to the status of Member State.

The situation is stable regarding the change in status from Associates of the CGPM to States Parties to the Metre Convention. This is despite ongoing efforts by the BIPM to persuade Associates to become Member States.

An informal approach has been received from Kosovo to participate in the activities of the BIPM. The present situation of Kosovo is that it is not recognized as a State by the whole international community. It could apply for the status of Economy Associate. This status will be discussed by the CGPM at its next meeting.

Dr Tanaka commented that Luxembourg has expressed keen interest in becoming a Member State. Mr Henson replied that a proposed visit by the Director of the BIPM to the Ministry of Economics of Luxembourg had to be postponed several times due to time constraints on the Minister.

## **7. PREPARATION FOR THE MEETING OF NMI DIRECTORS ON 25 MAY 2011**

Dr Inglis commented that not all NMI Directors were aware of the three new draft Resolutions on governance of the BIPM submitted by Switzerland (Draft Resolution K); the United Kingdom of Great Britain and Northern Ireland (Draft Resolution L); and France (Draft Resolution M). It was agreed that the NMI Directors should be made aware of these draft Resolutions. The authors of the three proposals have accepted the invitation to make presentations at the meeting of NMI Directors on 25 May 2011 and have accepted.

Prof. Uğur asked what the expectations were for the outcome of the meeting of NMI Directors. Dr Inglis replied that the meeting was primarily intended as an information sharing exercise.

## **8. PREPARATION FOR THE 24TH MEETING OF THE CGPM**

### **8.1 Programme of Work and budget 2013–2016; discussion on alternative funding scenarios**

Several CIPM members had pointed out at the 99th meeting of the CIPM that it was unlikely that all the scientific activities proposed in the Programme of Work and budget 2013–2016 could be funded. In response to these remarks, the BIPM developed four different funding scenarios to take this into account:

Scenario I – Dotation of 51.362 million Euros. This scenario is for the proposed Programme of Work and includes the funding of 3.7 million Euros for the cost of the linear accelerator (linac).

Scenario II – Dotation of 49.266 million Euros. This scenario comprises funding for the linac via voluntary contributions. Scenario II would allow the BIPM to carry out the proposed expansion of the organic chemistry programme.

Scenario III – Dotation of 47.553 million Euros. This scenario provides for a continuation of current activities with compensation for inflation. There would be no expansion in chemistry or dosimetry. The dotation in scenario III does not include a discretionary contribution from States Parties to the Metre Convention.

Scenario IV – Dotation of 45.850 million Euros. This scenario would require a reduction in the BIPM's activities due to the need to reduce expenditure by 1.4 million Euros.

The different scenarios are based on an estimate for inflation of 2 %. The latest figure for inflation in Europe for 2011 is 2.7 %. There are risks associated with scenarios III and IV if the BIPM were to encounter one or more significant but unexpected expenses, such as replacement of crucial equipment that unexpectedly failed or unforeseen building repairs.

The starting point to calculate the dotation for the Programme of Work for 2013–2016 is the dotation for 2012 agreed by the CGPM at its 23rd meeting plus the contributions from new Member States that have joined since the re-evaluated dotation was voted. The dotation for 2012 amounts to 11 185 000 Euros and contributions from new Member States increased this total to 11 462 390 Euros.

Dr Schwitz asked for clarification as to whether the scenarios included an option to fund the linac through voluntary contributions. Prof. Kühne replied that purchasing the linac was possible in scenarios I to II. If scenario III is approved and combined with a successful fund-raising for the required capital investment cost, the BIPM would identify ways to meet the minimum operating costs for the linac.

Prof. Kühne commented that scenario IV would represent a paradigm shift for the BIPM. On previous occasions the BIPM had always received at least compensation for inflation. Adoption of scenario IV would therefore imply a reduction in activities. In addition it raises concerns that a similar scenario may be retained for future programmes of work. If scenario IV is adopted, the entire role of the BIPM will need to be reviewed as all areas of work would be impacted in the long term, as would the situation regarding the Pension Fund.

Dr May asked for clarification if adoption of scenario IV would lead to a reduction in staff at the BIPM and whether it would be mandatory for the BIPM to increase pay for the BIPM's staff members if the scenarios include a provision for a 2 % rise in inflation. Prof. Kühne commented that all activities that are currently undertaken at the BIPM are considered to be core. Adoption of scenario IV would result in a decision having to be made on which activities to cancel. Dr May reiterated that the CIPM should make it clear to the NMI Directors and the representatives of Member States that scenario IV will lead to a reduction in staff. Prof. Göbel commented that a reduction in staff would result in extra costs for the Member States to cover redundancy packages. Mr Énard enquired if it would be possible to freeze salaries like was done for civil servants in France. Mrs Perent clarified the situation by saying that French law does not apply at the BIPM and that staff salaries are currently indexed to inflation in accordance with the *BIPM Regulations, Rules and Instructions applicable to staff members*.

Dr Quinn commented that if the BIPM ceases activities the costs will be borne by the Member States. Any activities that stop will have to be

transferred to the larger Member States along with the associated costs on an individual basis.

## **8.2 Draft Resolution on Terminology**

The CIPM recognized the need to clarify the confusion between the name of the intergovernmental organization created by the Metre Convention and the scientific and administrative institute located at the Pavillon de Breteuil. After a discussion it was decided to withdraw the draft Resolution on terminology and to postpone it with the future discussions on governance.

## **8.3 Possible draft Resolutions on governance issues**

Three draft Resolutions on the governance of the BIPM have been submitted by Switzerland (Draft Resolution K); the United Kingdom of Great Britain and Northern Ireland (Draft Resolution L); and France (Draft Resolution M). These draft Resolutions have been duly sent to States Parties to the Metre Convention. The draft resolutions were discussed by the CIPM members. The discussions concluded that:

- There is a need to review the role of the BIPM in the 21st century. The bureau of the CIPM is committed to this and a review is already under way, independently of the resolutions.
- The CIPM should follow up the comments that the role of the CIPM and governance of the BIPM should be reviewed before the CGPM meeting in 2015.
- A Working Group should be set up immediately to put forward a proposal to the CGPM regarding changes to governance of the BIPM.
- More transparency is needed and the flow of information back to stakeholders needs to be improved.
- There is definitely a need to improve the flow of information between the NMI Directors and the CIPM. A more efficient method may be to create a Working Group of NMI Directors to feed information back to the BIPM.
- The proposal for government representatives to meet once a year should be explored.

**8.4 Preparations for the informal meeting of representatives of States Parties to the Metre Convention on 26–27 May 2011**

The representatives of States Parties to the Metre Convention will be given a tour of the BIPM laboratories on 26 May 2011. This will give them an illustration of the work that is carried out at the BIPM.

**8.5 Interactions with governments before the meeting of the CGPM**

This matter has been reported in the Secretary's report.

**8.6 Arrangements for the 2011 meeting of the CGPM and session II of the 100th meeting of the CIPM**

Information concerning the arrangements will be circulated to members of the CIPM before Session II of the 100th meeting of the CIPM.

**8.7 Presentations of CC presidents to the CGPM**

Prof. Kühne commented that all of the CC President's reports should have been submitted by 13 March 2011. He mentioned that some reports are still outstanding and suggested that printed copies of the CC reports (in French and English) should not be distributed at the meeting of the CGPM. The delegates at the 24th meeting of the CGPM in October 2011 will hear oral presentations from the CC Presidents first and the written reports will be circulated afterwards as part of the CGPM meeting proceedings.

Prof. Uğur stated that he disagreed with this arrangement because the CC Presidents had been asked to produce their reports very quickly and he had expended considerable effort to meet the deadline. Prof. Kühne commented that editorial work on the reports and the translation into French place a heavy workload on the BIPM staff and that it would be difficult to manage this work in 2011, in addition to the workload associated with the CGPM meeting. Dr Inglis commented that some of the CCs met after the deadline for submission. Dr Kaarls suggested that all CC Presidents should supply their reports by mid-September 2011.

Prof. Kühne's suggestion on the CC reports was approved by the CIPM.

## **8.8 Arrangements for the 2012 meeting of the CIPM**

Prof. Kühne proposed that the 2012 meeting of the CIPM should be held in early June (5–8 June 2012). The reason for this change is because the annual financial statements need to be approved by the CIPM, shortly after the auditor's report is issued. The 26th meeting of the Consultative Committee for Thermometry (CCT) is scheduled for 21-25 May 2012, so it would be more practical to hold the CIPM meeting in June. Dr Valdés commented that the 8th meeting of the Consultative Committee for Acoustics, Ultrasound and Vibration (CCAUV) and its Working Groups is scheduled for 11-15 June 2012.

## **9. REPORT ON THE PRESENT STATUS OF THE CIPM MRA**

### **9.1 Joint Committee of the Regional Metrology Organizations and the BIPM (JCRB) report**

Prof. Kühne presented the 2011 JCRB report (CIPM 2011-03) on the 26th meeting of the JCRB to the CIPM.

Representatives from Egypt recommended that a new Regional Metrology Organization (RMO) should be set up in the Arabic region. It was considered that this is premature as, at present, there is insufficient metrological infrastructure and expertise available in the region.

The JCRB agreed that the Quality Management System (QMS) of the International Atomic Energy Agency (IAEA) should be reviewed by EURAMET. Prof. Kühne had convinced the IAEA that the review of its QMS by an RMO, as is carried out by all NMIs, is superior to the previous review by the JCRB.

The JCRB suggested that the BIPM should follow the example of the IAEA and have its QMS reviewed by an RMO and not by the JCRB. It suggested that the BIPM should go to the RMOs on a rotating basis. The CIPM discussed the proposal and approved it with the proviso that the recommendations from the QMS review by the RMOs are forwarded to the CIPM and that any decision remains with the CIPM.

The JCRB at its 26th meeting (2011) discussed comments made on the ILAC Document P10 on Traceability. ILAC has proposed a document which contains three main routes for traceability. The JCRB had discussed the draft



and a possible recommendation on a modification of the document. No consensus was reached in the discussion. At the core of the debate was the question of whether traceability to the SI through the calibration at an NMI was considered to be equivalent if an NMI has its capability confirmed by a Calibration and Measurement Capability (CMC) in the Key Comparison Database (KCDB) or when it had no such entry. The position of the BIPM Director and the Secretary of the CIPM was that these two ways were not equivalent as only the CIPM MRA assured the international recognition of the calibration. In the end the JCRB recommended that the International Liaison Officer of the BIPM will advise ILAC of serious concerns and differing views within the JCRB about the wording in the ILAC Document P10 on Traceability. The issue will be discussed again at the JCRB meeting in September 2011. The CIPM members fully supported the position that the BIPM Director and the CIPM Secretary had taken during the JCRB meeting.

Dr Kaarls enquired with whom ILAC discusses these issues. Prof. Kühne replied that the BIPM discusses these matters with ILAC and that it is the responsibility of the BIPM to report on the opinions expressed by the RMOs. Mr Henson participated in the ILAC meeting in April 2011 which discussed comments on P10 and he explained the different views expressed at the JCRB meeting.

Dr Quinn commented that if ILAC accepts the CIPM MRA, what is the point in NMIs seeking ILAC accreditation. Prof. Kühne replied that NMIs which seek accreditation are interested that the results obtained in that process can be made available in a suitable form to support the peer review process of the CIPM MRA.

## **9.2 Recommendations and resolutions from the JCRB to the CIPM**

No recommendations to the CIPM were issued at the 26th meeting of the JCRB.

### **9.3 Proposed revision of the CIPM MRA for discussion at the meeting of NMI Directors**

The addendum to the CIPM MRA was sent to the NMI Directors in January 2011. The addendum in particular acknowledged the need to update some standards and CMCs. All comments received from the NMI Directors until the time of the CIPM bureau meeting in March 2011 were discussed by the bureau.

The reference to “Members of the Metre Convention” being changed to “States Parties to the Metre Convention and States and Economies Associates of the CGPM” was rejected by the signatory from Spain who objected to the use of the word ‘economies’. It is hoped that a compromise will be reached in the meeting of the NMI Directors on 25 May 2011. If agreement is not reached the BIPM will be unable to proceed with the addendum and there will be no revision of the CIPM MRA.

## **10. INTERNATIONAL CO-OPERATION**

### **10.1 OIML**

Co-operation between the BIPM and the OIML is working very well. The bilateral meetings are successful and will be reported on at the meeting of NMI Directors on 25 May 2011. A meeting is held every three months between the Directors of the BIPM and the Bureau International de Métrologie Légale (BIML).

The OIML is presently reviewing the advantages and disadvantages of a rapprochement with the BIPM. This includes in particular the question of a co-location at the BIPM headquarters. The BIPM will receive a formal request from the BIML asking for details of the cost of such a co-location in mid-2011. It is not expected that the BIPM will provide a detailed answer until after the next meeting of the CGPM. The final report on the rapprochement by the BIML will be submitted to the OIML General Assembly in 2012.

**11. ANY OTHER BUSINESS**

None.

**12. DATE OF NEXT CIPM MEETING**

The proposed date for the 101st meeting of the CIPM is 4–8 June 2012.

## **Annex 1: Vacancy announcement for the post of Director of the BIPM**

### **Director**

The Comité International des Poids et Mesures (CIPM) invites applications for the post of Director of the Bureau International des Poids et Mesures (BIPM), which will fall vacant in the first half of 2014 on the retirement of the present Director, Prof. Dr. M. Kühne. The successful candidate will be engaged initially as Deputy Director (Director designate) and it is expected that he or she will take up the post of Deputy Director/Director designate in the first quarter of 2013.

The BIPM is the scientific and administrative centre of the Intergovernmental Organization of the Metre Convention. It operates under the authority of the CIPM, which itself is under the authority of the Conférence Générale des Poids et Mesures (CGPM) currently composed of fifty-five Member States of the BIPM.

The BIPM's scientific and administrative work has as its aim the assurance of a stable and reliable world-wide measurement system based on the International System of Units (SI). To achieve this, the BIPM works in close collaboration with the National Metrology Institutes (NMIs) of its Member States and liaises with other intergovernmental organizations and international bodies with an interest in reliable measurements as well as with the NMIs of the Associates of the CGPM.

The BIPM operates a world-class scientific laboratory charged with the realization and comparison of measurement standards in the fields of mass, time/frequency, electricity, ionizing radiation and chemistry.

The BIPM is also responsible for the implementation and maintenance of the *Mutual Recognition Arrangement of national measurement standards and of calibration and measurement certificates issued by National Metrology Institutes* (CIPM MRA). The CIPM MRA includes calibration and measurement capabilities in all fields of measurement and is executed in close cooperation with the Regional Metrology Organizations (RMOs).

### **Duties**

The Director is responsible to the CIPM for the running of the BIPM, which has an international staff of about eighty and an annual budget of some 12.5 million Euros. The Director acts as chief executive of the BIPM in the execution of its activities and carries a major responsibility for initiating and carrying through policy adopted by the CIPM on matters related to

international metrology. The Director participates in all meetings of the ten scientific Consultative Committees of the CIPM and is chairman of the *Joint Committee of the Regional Metrology Organizations and the BIPM*. The Director is expected to maintain contact, either directly or through the RMOs, with the NMIs of the Member States.

Further, the Director is expected to liaise actively with other intergovernmental organizations and international bodies with the aim of improving the comparability and reliability of measurement results in support of fair trade, the elimination of technical barriers to trade, industrial innovation, society and quality of life. He/she shall pay special attention to the development and improvement of the metrological infrastructure in developing countries.

### **Deputy Director/Director designate**

Until the retirement of the present Director, the Director designate will hold the post of Deputy Director. There will be a probationary period of one year from the date of appointment as Deputy Director.

### **Employment conditions**

The BIPM is located at the Pavillon de Breteuil in Sèvres, France, situated in the outskirts of Paris. The BIPM offers a full-time appointment for an initial period of 5 years renewable.

The salary is commensurate with the responsibilities and duties of the post. Living accommodation is provided at the premises of the BIPM. Conditions of employment, subject to the decisions of the bureau of the CIPM, are detailed in the Regulations, Rules and Instructions applicable to staff members of the BIPM. The BIPM operates its own contributory pension scheme and subscribes to a private medical insurance plan for its staff and their families. The BIPM, its staff and its site enjoy privileges and immunities normally granted by the French government to intergovernmental organizations.

### **Qualifications**

A chief executive is sought with an outstanding record of achievement in science and technology, with proven leadership and management capabilities in a research based environment, and with demonstrated diplomatic skills.

Candidates are required to be fluent in English and be prepared to obtain a working knowledge of French, although the latter is not a requirement at the outset.

## **Applications**

Applications should be sent to the President of the CIPM, Dr. B.D. Inglis, and should include a covering letter, a *curriculum vitae*, a list of publications and the names of three referees who may be approached to give their opinion on the candidate's suitability for the post. Shortlisted applicants will be invited for an interview. Prospective candidates are encouraged to make preliminary contact, in confidence, with either the President of the CIPM ([barry.inglis@measurement.gov.au](mailto:barry.inglis@measurement.gov.au)) or the Director of the BIPM ([mkuehne@bipm.org](mailto:mkuehne@bipm.org)). More information on the BIPM and its activities are to be found on the BIPM web site: <http://www.bipm.org>

*The BIPM is an Equal Opportunity Employer.*

Applications should be addressed to:  
The President of the CIPM Dr. B.D. Inglis  
BIPM  
Pavillon de Breteuil  
F-92312 Sèvres Cedex  
France

**Application Closing Date: Thursday 1 December 2011**







International Committee  
for Weights and Measures

**Proceedings of Session II  
of the 100th meeting**  
(10 – 14 October 2011)

## Agenda

1. Opening of the meeting; quorum; agenda
2. Report of the Secretary and activities of the bureau of the CIPM
3. Membership of the CIPM and other matters
4. Membership of the bureau of the CIPM
5. Preparation for the 24th meeting of the CGPM
6. Reports from Consultative Committees
7. Depository of the metric prototypes
8. Report on the present status of the CIPM MRA
9. Joint BIPM, OIML, ILAC and ISO declaration on metrological traceability
10. BIPM/ILAC Joint Working Group
11. Contacts with other intergovernmental organizations and international bodies
12. State Parties to the Metre Convention and Associates of the CGPM
13. Joint Committee for Guides in Metrology (JCGM)
14. Work of the BIPM
15. *Metrologia*
16. Administrative and financial affairs
17. Other business
18. Date of next meeting

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

The International Committee for Weights and Measures (CIPM) held Session II of its 100th meeting from Wednesday 12 October to Friday 14 October 2011 at the BIPM Headquarters in Sèvres.

Present: S. Bennett, K. Carneiro, K.H. Chung, Y. Duan, L. Énard, E.O. Göbel, F. Hengstberger B. Inglis, L.K. Issaev, R. Kaarls, W.E. May, J.W. McLaren, H.O. Nava-Jaimes, A. Sacconi, W. Schwitz, M. Tanaka, H. Uğur, J. Valdés, and M. Kühne, Director of the BIPM.

Also attending, CIPM Honorary Members: W.R. Blevin, K. Iizuka, and D. Kind, and Emeritus Director of the BIPM: T.J. Quinn.

Also attending: S. Arlen (Legal Adviser of the BIPM), F. Joly (Head of Communication and Information Section), B. Perent (Financial and Administrative Director of the BIPM), C. Planche (Communication and Information Section), and R. Sitton (Communication and Information Section).

Also in attendance for parts of the meeting: Ö. Altan (Executive Secretary of the Joint Committee of the Regional Metrology Organizations and the BIPM), I. Andernack (Finance, Administration and General Services Department), J.R. Miles (Communication and Information Section), A. Henson (International Liaison Officer), I.M. Mills (President of the CCU), and T. Usuda (on secondment at the BIPM). The following Executive Secretaries of Consultative Committees were also present: P.J. Allisy-Roberts (Director of the Ionizing Radiation Department), E.F. Arias (Director of the Time Department), A. Picard (Director of the Mass Department), L. Robertsson (Time Department), M. Stock (Director of the Electricity Department), C. Thomas (KCDB Coordinator), and R.I. Wielgosz (Director of the Chemistry Department).

Dr Inglis, President of the CIPM, opened Session II of the 100th meeting of the CIPM. With all 18 members present the quorum was satisfied according to Article 12 of the Regulations annexed to the Metre Convention.

Dr Inglis noted with sadness the announcement of the death of Pierre Giacomo and Daheng Wang. Pierre Giacomo joined the BIPM as *physicien chercheur principal* in 1966. He was appointed by the CIPM as

Deputy Director in 1968 and as Director Designate in 1976. He became Director of the BIPM in 1978, a post he held until his retirement in 1988. Upon his retirement, he was elected Emeritus Director of the BIPM by the CIPM. Dr Inglis read his obituary, a copy of which is annexed to the present report. Daheng Wang was a member of the CIPM from 1979 to 1992. He was the first member of the CIPM of Chinese nationality. A minute's silence was observed in their memory.

There were no changes to the agenda.

## **2. REPORT OF THE SECRETARY AND ACTIVITIES OF THE BUREAU OF THE CIPM (MAY 2011–OCTOBER 2011)**

Note: this report is the 2nd part of the Secretary's report to the CIPM at its 100th meeting. The 1st part was presented to the CIPM on 24 May 2011.

### **2.1 Meetings of the bureau of the CIPM**

The bureau has met on two occasions since the last meeting of the CIPM: on 27 May 2011 and 10–11 October 2011. These meetings took place at the BIPM headquarters. The Secretary made an additional visit to the BIPM headquarters on 23 September 2011.

The meeting on 27 May 2011 took place following the meetings of the Directors of the National Metrology Institutes (NMIs) held on 25 May 2011 and of the Representatives of States Parties to the Metre Convention held on 26–27 May 2011. Part of the bureau meeting on 27 May 2011 was attended by a number of CIPM members who were still present at the BIPM headquarters after the closing of the meeting of the Representatives of States Parties to the Metre Convention.

### **2.2 CIPM Membership**

There have been no resignations from the CIPM since its last meeting in May 2011.

## **2.3 States Parties to the Metre Convention (Member States) and Associates of the CGPM (Associates)**

Since the meeting of the CIPM in May 2011 no States have acceded to the Metre Convention, so the number of Member States remains at 55. Montenegro became an Associate on 1 August 2011, bringing the number of Associates to 34.

## **2.4 Outreach**

The International Liaison Officer of the BIPM has built up a large number of contacts with States interested in becoming either a State Party to the Metre Convention or an Associate of the CGPM. Further growth is expected; in particular Tunisia, currently an Associate of the CGPM may become a State Party to the Metre Convention in the near future.

## **2.5 States Parties to the Metre Convention in financial arrears for more than three years**

Four States Parties to the Metre Convention have been in arrears for more than three years: Cameroon, Democratic People's Republic of Korea, the Dominican Republic and the Islamic Republic of Iran. Contact with these States continues and will be reported later in the agenda. Each has been duly reminded that, if there is no change in the situation regarding their financial arrears and no rescheduling agreement is concluded before the 24th meeting of the CGPM, which starts on 17 October 2011, then the agenda point of the 24th meeting of the CGPM related to their exclusion for failure to fulfil their financial obligations will be examined and the CGPM will take a decision with regard to their exclusion pursuant to Article 6 paragraph 8 of the Regulations annexed to the Metre Convention and to Resolution 8 adopted by the CGPM at its 23rd meeting (2007).

The Dominican Republic has announced its intention to repay its arrears, but no details are yet available.

## **2.6 BIPM administrative and staff matters**

2.6.1 As usual, at each meeting, the CIPM bureau receives reports on the financial situation of the BIPM throughout the year. The change from a cash

accounting system to an accrual accounting system has given much more insight into the BIPM financial situation, such as the amount of depreciation and the health insurance provision.

- 2.6.2 The Programme of Work and corresponding budget of the BIPM for the period 2013 to 2016 were presented to and discussed by the NMI Directors at their meeting on 25 May 2011 and by the Representatives of States Parties to the Metre Convention on 26–27 May 2011. Given the difficult national budgetary situation in a number of States Parties to the Metre Convention, four different funding scenarios were presented for discussion.
- 2.6.3 Other points discussed by the bureau included the Financial Regulations of the BIPM Pension and Provident Fund, Guidelines for the acceptance of third party funding (grants and donations), the quality and safety situation at the BIPM and the renewal of the BIPM IT infrastructure.
- 2.6.4 An external actuarial study of the BIPM Pension and Provident Fund will be carried out during 2012–2013 in order to review the long-term sustainability of the Fund, as is done on a regular basis. The Health Insurance provision, which represents the estimated actual liability of the defined benefits for health insurance of staff members and retirees, was included in the BIPM Financial Statements for the first time in accordance with the International Public Sector Accounting Standard (IPSAS) and will have to be addressed.
- 2.6.5 The current director of the BIPM will retire in March 2014, and in accordance with the decision taken by the CIPM at its previous session in May 2011, the CIPM bureau has arranged that the vacancy notice for the post of Director of the BIPM will be advertised in a number of relevant journals and newspapers. In addition, the vacancy notice has been communicated to the States Parties to the Metre Convention, the Associates, National Metrology Institutes (NMIs) and placed on the BIPM website. The Search Committee set up by the CIPM has been active in looking for potential candidates for the post of Director of the BIPM. The deadline for applications is 1 December 2011.

## **2.7 Meeting with NMI Directors and Representatives of States Parties to the Metre Convention**

Topics discussed at the meeting of the NMI Directors included the present situation of the proposed redefinition of some of the base units of the SI, a proposed update of the text of the CIPM MRA, the BIPM Programme of

Work and corresponding budget for 2013 to 2016, and governance of the BIPM. The meeting of the Representatives of States Parties to the Metre Convention focused mainly on the proposed BIPM Programme of Work and corresponding budget for 2013 to 2016, and the governance of the BIPM.

An outcome of the two meetings was that all States Parties to the Metre Convention strongly supported and appreciated the Metre Convention and the work of the BIPM. It was noted that the BIPM is moving forward with, for example, the development of the CIPM MRA. The proposed BIPM Programme of Work for 2013 to 2016 was not seriously questioned, but it is unlikely that the budget needed for its realization will be approved in full. What can be expected at best is compensation for inflation, and a number of States Parties to the Metre Convention may be prepared to support the BIPM with additional voluntary contributions.

Following receipt of draft Resolutions presented by Switzerland, the United Kingdom of Great Britain and Northern Ireland, and France, respectively, the bureau of the CIPM has prepared a draft Resolution on the role, mission, objectives, long-term strategy and governance of the BIPM, which was approved by the CIPM by correspondence on 11 June 2011 and circulated to States Parties to the Metre Convention on 14 June 2011 for consideration at the forthcoming meeting of the CGPM, and to Associates of the CGPM for information. This Draft Resolution combines a number of issues mentioned in the drafts presented by the three above-mentioned States. It also includes a proposal for a review of the role, mission and governance of the BIPM for the long term.

The bureau prepared a proposal for an *ad hoc* Working Group, comprising CIPM members, representatives of States Parties to the Metre Convention, and NMI Directors, who would undertake this review, report their findings and make proposals for improvement to the CIPM. The CIPM will in turn present a progress report to Representatives of States Parties to the Metre Convention at a meeting to be held in 2012 and a draft final report at a meeting in 2013.

## 2.8 The CIPM MRA

New signatories of the CIPM MRA were: the NMI of Saudi Arabia on 25 May 2011, the NMI of Bosnia and Herzegovina on 15 June 2011, and the NMI of Pakistan on 6 July 2011, which brings the number of signatories of the CIPM MRA to 86 NMIs from 50 States Parties to the Metre Convention,

33 Associates of the CGPM and 3 international organizations (International Atomic Energy Agency (IAEA), Institute for Reference Materials and Measurements (EC JRC IRMM), World Meteorological Organization (WMO)).

The Joint Committee of the Regional Metrology Organizations and the BIPM (JCRB) met on 14–15 September 2011 at the Bundesamt für Eich- und Vermessungswesen (BEV), the Austrian NMI, in Vienna. The CIPM will be invited to approve some JCRB documents later in this meeting.

## **2.9 The BIPM Quality Management System and Health and Safety System**

The BIPM Quality Management System (QMS) was audited during the week of 19 September 2011 by an expert from the Asia Pacific Metrology Programme - APMP (see Section 14.3). The auditor concluded in her assessment report that the BIPM's Quality Management System is fully implemented and that the BIPM is committed to the development and continual improvement of its effectiveness. No 'non-compliances' were found. On the basis of this audit and other external technical expert audits which took place earlier in 2011, it was concluded that the QMS complies with the relevant criteria of ISO/IEC 17025:2005 and the ISO Guide 34: 2009.

The annual management review of the BIPM QMS took place on 23 September 2011. The results of internal and external audits undertaken during September 2010 - September 2011 and some further issues to be considered for improvement were identified and discussed. It was concluded that the QMS is successfully in place, and that it covers all relevant external services and functions.

Internal audits, undertaken as part of the Health and Safety System, were carried out against benchmarks formulated on the basis of an earlier external assessment. The internal audits were satisfactory. Over the next 12 months a further review of the BIPM Health and Safety System, including risk analysis and maintenance and emergency measures, will take place.

The next annual Management Review meeting of the QMS will take place on 5 October 2012. This will be followed by a Management Review meeting of the BIPM Health and Safety System.



## **2.10 Relations with other intergovernmental organizations and international bodies**

- 2.10.1 The cooperation between the BIPM and the OIML continues, including on a possible ‘rapprochement’, as will be reported later in the agenda.
- 2.10.2 The cooperation between the BIPM and ILAC continues in a satisfactory way. An ILAC document on the accreditation of calibration and measurement services of NMIs has been finalized and is ready for approval by ILAC members. A further ILAC document on traceability is close to being finalized.
- 2.10.3 After successful discussions between the BIPM, OIML, ILAC and ISO approval is being sought for a quadripartite document which will address the roles, mission and activities of the four organizations with respect to metrological traceability of measurement and test results.

## **2.11 Preparations for the 24th meeting of the CGPM**

The bureau of the CIPM has been involved in the preparations for the 24th meeting of the CGPM. In particular, the bureau was informed that a number of States Parties to the Metre Convention have approached the BIPM to request further information on issues addressed in some draft Resolutions as well as rules and processes related to the CGPM meetings.

Dr Inglis thanked Dr Kaarls for his report and invited questions from the CIPM members.

Dr Inglis reported that the search for the next BIPM Director has started. The closing date for applications is 1 December 2011 and it is the intention of the bureau to hold the interviews on 1–2 March 2012. There was some discussion by the bureau concerning the composition of the selection committee. The CIPM bureau recommends that the selection committee consist of the bureau members and one additional person appointed externally. This is approved by the CIPM.

The meeting of the NMI Directors and the meeting of Representatives of States Parties to the Metre Convention in May 2011 recommended that an *ad hoc* Working Group be formed to review governance issues at the BIPM. The Working Group would comprise government representatives, NMI Directors and it was recommended that it have a good geographic distribution. The aim is an *ad hoc* Working Group of no more than

10 members. The composition of the *ad hoc* Working Group will be discussed in detail later in the agenda.

### **3. MEMBERSHIP OF THE CIPM AND OTHER MATTERS**

As always, the CIPM is open to receiving new CVs. Some members of the CIPM are expected to step down during the next four years.

#### **3.1 Presidentship of Consultative Committees**

Prof. Uğur intends to step down as President of the Consultative Committee for Thermometry (CCT) after the next meeting of the CCT in 2012. He suggested Dr Duan as a possible replacement. After a brief discussion, this suggestion was unanimously accepted by the CIPM and Dr Duan was nominated as the next President of the CCT. Dr Duan accepted and stated that it is a great honour and a great challenge.

Dr Kaarls intends to step down as President of the Consultative Committee for Amount of Substance – Metrology in Chemistry (CCQM) at the end of 2012. He has held this position for 20 years. Dr Kaarls proposed Dr May as his successor. The CIPM unanimously approved this proposal and Dr May was nominated as the next President of the CCQM.

The other CIPM members who are also Consultative Committee Presidents expressed their willingness to remain in position.

Dr Carneiro asked if the CIPM could provide guidance on the selection of CC Presidents. A profile is needed for the attributes that a CC President should possess. Dr Inglis stated that the suggestion of a successor does not necessarily mean that this person will be nominated by the CIPM. Dr Valdés added that CIPM members should possess metrological, scientific and management expertise.

Dr Inglis suggested that collaboration between CCs could be taken a stage further if a regular workshop is held between all CC Presidents.

Dr Issaev commented that it is desirable for all potential members of the CIPM to possess a particular speciality, for example accreditation or units. This would be of benefit when nominating a CC President from within the

CIPM. If there is no CIPM member with the correct experience then an outside person may have to be appointed, as was the case with Prof. Mills for the CCU Presidency.

Dr Quinn commented that a desirable profile had previously been drawn up for potential members of the CIPM. He questioned the necessity for a workshop for all CC Presidents to share information and suggested that the Director of the BIPM as an *ex-officio* member of each CC provided the link.

Dr Bennett suggested that CC Presidents be drawn from the wider metrological community; who could then later serve on the CIPM after being appointed. Half of the CIPM could be made up of such CC Presidents and the other half could be selected from people with management experience.

Dr Inglis stated that the CIPM must have a good geographical distribution of members. Prof. Kühne added that members of the CIPM have to comply with a range of different criteria. These criteria, as adopted by the CIPM at its 94th meeting, are the following:

- Persons proposed for election are always of a high scientific standing and have experience which qualifies them to take part in the work of the CIPM.
- In accordance with the discussion at the 17th CGPM, the CIPM should – in general – ensure that the candidate is acceptable to his or her government at the time of provisional election. The bureau encourages the members of the CIPM to continue to maintain this relationship throughout their membership of the CIPM.
- Care is taken to ensure an appropriate spread of scientific disciplines.
- Members should be prepared to make a significant contribution of time and effort to the work of the Metre Convention.
- Efforts are made to maintain a reasonable balance between regions and also to ensure the presence of a small number of members from those States paying the minimum contribution.
- Candidates from Member States three or more years in arrears with their payments to the BIPM are not considered for election.

- One member of the CIPM is always of French nationality. This recognizes the role of France as the originator of the metric system and the depository of the Metre Convention.
- One member comes from each State paying the maximum contribution.
- Particular consideration is given to candidates from States which pay a contribution of 2 % or above.

Dr Quinn suggested that the Editorial Board of *Metrologia* would be improved if it consisted of the CC Presidents. It would be able to meet at the same time as the scheduled CIPM meetings.

#### **4. MEMBERSHIP OF THE BUREAU OF THE CIPM**

Dr Inglis reminded the CIPM that there will be a short meeting after the close of the meeting of the CGPM to elect the bureau. All the current members of the bureau (Dr Inglis, Dr Kaarls, Dr McLaren and Dr May) are willing to have their mandate renewed. Dr Inglis asked that any other members of the CIPM interested in becoming a bureau member to inform him before the end of the CIPM meeting.

#### **5. PREPARATION FOR THE 24TH MEETING OF THE CGPM**

##### **5.1 Outcome of the NMI Directors' meeting on 25 May 2011 and of the informal meeting of representatives of States Parties to the Metre Convention on 26–27 May 2011**

Dr Inglis briefly summarized the two meetings. The Representatives of States Parties to the Metre Convention held a closed session to discuss the various funding options submitted to them by the BIPM. Their views on the proposed funding scenarios ranged from full support for the BIPM's proposed Programme of Work to a reduction in BIPM activities to a level below those currently performed. A majority of the participants expressed support for scenario III consisting of funding the continuation of the present activities. Dr Inglis commented that the CIPM should continue to reflect on

governance as addressed in the three draft Resolutions on governance of the BIPM submitted by Switzerland (Draft Resolution K); the United Kingdom of Great Britain and Northern Ireland (Draft Resolution L); and France (Draft Resolution M). A Draft Resolution was agreed upon by the CIPM by correspondence in May 2011 (Draft Resolution N) and some changes to this Draft Resolution were contemplated. Dr Inglis hoped that Draft Resolution N addresses the concerns and issues on the governance of the BIPM raised in Draft Resolutions K, L and M and that therefore Switzerland, the United Kingdom of Great Britain and Northern Ireland, and France will withdraw the Draft Resolutions.

## **5.2 Interactions with governments before the CGPM meeting**

Prof. Kühne reported that there have been no meetings with government officials since Session I of the 100th meeting of the CIPM in May 2011, although there have been a number of informal discussions.

## **5.3 Discussion on the BIPM dotation**

Dr Inglis commented on the composition of the Working Group on the Dotation which will meet in the afternoons of Tuesday 18 October and, if necessary, Thursday 20 October 2011 at the meeting of the CGPM. It was suggested that the draft list for the Working Group on the Dotation include representatives from the following States: Australia, Brazil, Canada, China, France, Germany, Italy, Japan, Republic of Korea, Mexico, New Zealand, the Netherlands, Russian Federation, South Africa, Spain, Switzerland, United Kingdom of Great Britain and Northern Ireland, and the United States of America. The list will be proposed to the CGPM at its meeting for its approval. The list is not exhaustive and the other States Parties to the Metre Convention will be invited to join if they wish to attend. Prof. Uğur enquired why a list of potential members of the Working Group on the Dotation is needed before the CGPM meeting. Dr Inglis commented that the list reflects in particular the contributions made by States Parties to the Metre Convention and includes a mix of Member States that pay the maximum, intermediary and minimum contributions. Dr Inglis also commented that States Parties to the Metre Convention which are not on the list are not excluded from participating and that those on the list do not have to take part in the Working Group. Dr Schwitz enquired about Chairmanship

of the Working Group on the Dotation and whether the CIPM is represented. Dr Inglis confirmed that the CIPM will be represented by Dr Inglis and Dr Kaarls. Prof. Kühne and Mrs Perent will also attend.

Dr Inglis commented that feedback from representatives of States Parties to the Metre Convention indicated that there was general support for scenario III (funding of continuation of present activities with compensation for inflation) in the Programme of Work and budget for 2013 to 2016. Dr Kaarls cautioned that the four scenarios were based on an inflation rate of 2 %. At present, the inflation rate in Europe is predicted to be above 2 % in 2011. Prof. Kühne asked individual members of the CIPM if they had an idea on which of the four funding scenarios of the Programme of Work and budget for 2013 to 2016 that their respective governments were likely to accept. Support would range from scenarios I to IV, but the majority expected support for scenario III.

Dr Tanaka enquired if there is support for discretionary contributions among the representatives of States Parties to the Metre Convention. Prof. Göbel suggested that the term ‘voluntary’ may be preferable to ‘discretionary’. Dr McLaren commented that there are many questions about discretionary contributions and that Canada may be unwilling to pay discretionary contributions. Dr Kaarls commented that governments may be unwilling to make additional contributions to their compulsory contribution if they do not receive information on the activity that they would fund. He cautioned against linking discretionary contributions to the plan to acquire a linear accelerator (linac) for the BIPM. Dr Carneiro mentioned that he considered that the only method to secure funding for the linac would be to obtain support for the project from the States Parties to the Metre Convention and then to seek funding from foundations. Dr Inglis commented that other sources of funding have been explored without success so far. Dr Carneiro reaffirmed his belief that foundations may fund the linac if the BIPM obtained a firm commitment for the project from Member States.

Dr May recommended the term ‘additional contributions’ be used instead of ‘discretionary’. It should be made clear that any additional contributions received will be for projects such as the linac or activities within the general work of the BIPM. Mrs Perent addressed the difficulties of managing the BIPM without a prior commitment from Member States on the level of additional discretionary contributions. In any case, additional discretionary contributions should not be used to fund the BIPM core activities and BIPM overheads. Dr Inglis recommended adding text to Draft Resolution C to

make it clear that although discretionary or voluntary contributions are not compulsory, States Parties to the Metre Convention can make additional contributions. Prof. Kühne commented that governments may be reluctant to make discretionary contributions and that additional contributions could be contemplated for a specific purpose and not merely for an increase of the regular budget. He added that voluntary contributions for a specific project are likely to be more acceptable. Prof. Kühne also commented that if States Parties to the Metre Convention identify a project as a necessity, then the BIPM can approach governments and charities for additional funding. Dr Kaarls does not support the idea of voluntary contributions, stating that it is preferable to know the exact amount of funds which are available because voluntary contributions are not guaranteed.

Dr Carneiro stated that the Consultative Committee for Ionizing Radiation (CCRI) has changed its emphasis for the linac project. The CCRI now recommends that a Centre of Excellence for Dosimetry is set up as a precursor to the linac project, rather than trying to purchase the linac first. He explained that funding bodies are more likely to support funding for a Centre of Excellence than outright purchase of a linac. Dr Inglis commented that this idea may receive more support than straight funding for the linac, but cautioned that States Parties to the Metre Convention may have reservations about signing up for a Centre of Excellence because it may be perceived as an open-ended cost, whereas buying a single piece of equipment (the linac) is a fixed cost. Prof. Kühne stated that it is too late to present a new idea to the CGPM, although a Centre of Excellence for Dosimetry could be considered in the future.

Dr Tanaka stated that the Japanese government may like to see a clearer definition of discretionary contributions. Mrs Perent commented that care should be taken over the wording in Draft Resolution C. It should be made clear whether States Parties to the Metre Convention will fund the BIPM regular budget or specific projects with additional contributions. There exists a danger of relying on discretionary contributions for the BIPM that may not be forthcoming. Mrs Perent cautioned that some States Parties to the Metre Convention are unwilling to make discretionary contributions. Prof. Kühne agreed stating that there is reluctance to continue with discretionary contributions. States Parties to the Metre Convention willing to make additional contributions should be invited to make a commitment about the amount. Mrs Perent commented that some international organizations operate two separate budgets; an operational budget for running the organization and a second budget allowing their Member States to fund

specific projects. The latter is not necessarily funded by all the Member States of the organization.

Prof. Uğur enquired if it is possible to determine a correlation between the States Parties to the Metre Convention that will benefit from the linac and those that are willing to contribute to its cost. Dr Carneiro predicted that States Parties to the Metre Convention that already have a linac will oppose the project, whereas the other States Parties to the Metre Convention which do not and will benefit the most will support it. Prof. Kühne commented that 80 % of States Parties to the Metre Convention do not possess a linac and that the International Atomic Energy Agency (IAEA), World Health Organization (WHO), International Organization for Medical Physics (IOMP) and International Commission on Radiation Units and Measurements (ICRU) all support the project. The linac project appears to be more supported by non-metrologists than by metrologists. Prof. Uğur added that the linac project needs to be better presented to governments to convince them that a linac is needed at the BIPM. Dr May expressed surprise that the linac project was being discussed again. It was clear from the meetings of NMI Directors and representatives of States Parties to the Metre Convention that there was little support for the linac. Dr Valdés commented that the States Parties to the Metre Convention should be asked to vote on funding for specific projects. Then, if a particular project was rejected, it will allow better targeting of resources. Dr Inglis agreed that there was no overwhelming support for linking contributions to the linac project and suggested that States Parties to the Metre Convention should be given an opportunity to make extra contributions, although the term ‘discretionary’ needs to be replaced with more appropriate wording.

Dr Tanaka enquired if additional contributions will be set at a particular level. Dr Kaarls commented that the Dutch government is more likely to make additional contributions if the amount is known. Mrs Perent commented that Resolution 3 adopted by the CGPM at its 23rd meeting (2007) included wording for the provision of voluntary contributions to the BIPM.

#### **5.4 BIPM Programme of Work and budget for 2013 to 2016**

Prof. Kühne commented that the draft BIPM Programme of Work and budget for 2013 to 2016 had been disseminated to the States Parties to the Metre Convention. A presentation is ready for the 24th meeting of the



CGPM. Dr Inglis asked if members of the CIPM had further comments on the proposed Programme of Work. Prof. Göbel commented that if the CGPM agrees on the BIPM Programme of Work for 2013 to 2016 but not on the corresponding budget it will need to state that it approves the Programme of Work in principle even though the budget might not be sufficient to fund the whole programme. He stated that the German government may be prepared to support the proposed BIPM Programme of Work for 2013 to 2016. The CIPM will establish priorities on the BIPM Programme of Work for 2013 to 2016 at its meeting in June 2012 on the basis of the approved dotation. Dr Quinn stated that during discussions on the Programme of Work at meetings of the CGPM, there should be an emphasis on the provisions of the Metre Convention that make it clear that work carried out by the BIPM is done in common on behalf of all States Parties to the Metre Convention. If this were not the case, then the work would have to be carried out individually, at a significantly higher cost to the States Parties to the Metre Convention.

## **5.5 Report of the President of the CIPM**

Dr Inglis commented that because the report is long he will read highlights to keep within the 45 minute time slot at the meeting of the CGPM.

## **5.6 Comments on the presentations by Presidents of Consultative Committees**

Dr Inglis reminded the Presidents of the ten CCs that their reports should be kept as succinct as possible and they should try and keep within the 15 minute time slots. Each presentation should be no more than 10 minutes, with 5 minutes set aside for comments and questions. Presentations should focus on the work of each CC. The CC Presidents should not spend time providing details of key comparisons (KCs). Prof. Kühne supported this advice and added that CC Presidents should concentrate on information important to the delegates at the meeting of the CGPM, bearing in mind that many are non-metrologists.

## 5.7 Draft resolutions

### Draft Resolution A

Prof. Kühne commented that in Draft Resolution A ‘on the possible future revision of the International System of Units, the SI’ there is a typographical error in the bullet point:

- that the molar mass of carbon 12  $M(^{12}\text{C})$  will be  $0.012 \text{ kg mol}^{-1}$  but with a relative uncertainty equal to that of the recommended value of  $N_{\text{A}}$  just before redefinition and that subsequently its value will be determined experimentally.

$N_{\text{A}}$  should in fact be  $N_{\text{A}}h$ . Therefore, the bullet point should read:

- that the molar mass of carbon 12  $M(^{12}\text{C})$  will be  $0.012 \text{ kg mol}^{-1}$  but with a relative uncertainty equal to that of the recommended value of  $N_{\text{A}}h$  just before redefinition and that subsequently its value will be determined experimentally.

Dr Kaarls commented that there had been extensive discussions within the International Union of Pure and Applied Chemistry (IUPAC) about whether it supported the proposed redefinitions of the mole and the kilogram. These discussions are ongoing. It is believed that only a relatively small number of persons in IUPAC oppose the redefinitions. Prof. Kühne stated that he and Dr Wielgosz will meet with the President of IUPAC at the BIPM headquarters on 28 October 2011 to discuss the IUPAC’s position. The IUPAC Interdivisional Committee on Terminology, Nomenclature and Symbols (ICTNS) will create a Working Group to study the proposed redefinition of the mole. It is expected to report its findings to the BIPM in 2013. Prof. Göbel enquired if discussions within IUPAC will lead to postponement of the redefinitions. Dr Inglis commented that the presentation on Draft Resolution A to the CGPM will include a brief statement acknowledging the ongoing debate within IUPAC and that it is not expected that any postponement will result from the debate.

Prof. Kühne stated that Draft Resolution A will allow the CIPM to make its intentions over the redefinitions known. A decision on the redefinitions will not be made at the forthcoming meeting of the CGPM, only the intention to do so when the scientific research is complete and there are no new serious objections. When the situation develops, as expected, a Draft Resolution will be put forward to adopt the redefinitions. Dr Quinn reaffirmed this position,

stating that the purpose of Draft Resolution A is to tell the world what is intended.

Dr McLaren stated that, although there is still some debate in the IUPAC, the IUPAC Interdivisional Committee on Terminology, Nomenclature and Symbols (ICTNS) has given unequivocal support to Draft Resolution A.

Prof. Kühne commented that Draft Resolution A was agreed by the CIPM in 2010. There is no reason to make changes to the Draft Resolution, apart from correcting the typographical error mentioned earlier. Draft Resolution A tells the world of the intention for a possible future revision of the SI but does not give details of how this will be done. He acknowledged that not everyone agrees with the proposal. Dr Issaev agreed but with reservations. He stated that it may be necessary to return to Draft Resolution A to make changes so that the final definitions are less rigid.

Dr Tanaka commented that metrologists in Japan would like to see changes to Draft Resolution A to make the definitions easier to understand and that the inclusion of a statement clarifying the role of NMIs in the redefinitions is desirable. Dr Tanaka informed the CIPM that the Japanese delegation may propose some revisions at the meeting of the CGPM. Dr Inglis added that it may be possible to add comments to Draft Resolution A to make it more understandable in the future.

A brief discussion took place on whether to add an extra sentence to Draft Resolution A. A meeting will be held between Dr Issaev, Prof. Mills, Dr Quinn, Dr Tanaka and Dr Valdés to discuss the issue after the close of the Session.

Prof. Uğur enquired what the outcome might be if Draft Resolution A was not adopted at the CGPM meeting and speculated on whether the project for the possible future revision of the SI is moving too fast. Dr Quinn commented that the CIPM could lose credibility if Draft Resolution A is not adopted, and reminded the CIPM that the SI was adopted at the meeting of the CGPM in 1960 despite a number of reservations.

Dr Valdés remarked that in previous meetings of the CIPM it had been decided that the term 'new SI' would not be used in discussions of the possible future revision of the SI. However, the term has come into common use with the Royal Society meeting held in London, UK, under the banner of the 'new SI' and its use on the BIPM website and in press releases. He asked for clarification on the use of the term 'new SI'. Prof. Kühne commented that 'new SI' is in common use and that it is accepted. Dr Quinn added that

there is a need to explain the possible future revision of the SI to the public and the 'new SI' is a good way of highlighting it.

### Draft Resolution B

No changes were proposed to Draft Resolution B 'On the importance of international collaboration so as to place measurements to monitor climate change on an SI traceable basis'. Dr Kaarls commented that cooperation between the BIPM and the World Meteorological Organization (WMO) is moving forwards.

### Draft Resolution C

There were no comments on Draft Resolution C on the 'Dotation of the BIPM for the years 2013 to 2016'.

### Draft Resolution D

Dr Kaarls stated that Draft Resolution D 'On the status of Associate State of the General Conference' is important because it encourages Associate States of the General Conference with at least one Calibration and Measurement Capability (CMC) listed in the KCDB to accede to the Metre Convention. There is an unbalanced situation between their subscription and the benefits they gain. Associates have no voting rights at the meetings of the CGPM but they have the right to participate in discussions. Dr Bennett enquired if the Associate States were aware of Draft Resolution D. Prof. Kühne replied that the Associate States had been made aware of the proposal in the Convocation to the meeting of the CGPM as well as at the meeting of NMI Directors and no major objections were noted. Draft Resolution D includes proposals to raise the annual subscription of Associate States. Dr Hengstberger provided feedback from some of the Associate States: the proposal seeks to raise the minimum annual subscription for Associate States to 0.1 % of the annual dotation of the BIPM from the current level of 0.05 % (an increase from about 5 000 Euros to about 10 000 Euros). This is a significant increase for some of the smaller Associate States and they may terminate their Associate status.

## Draft Resolution E

Dr Kaarls commented that Draft Resolution E ‘on the acceptance of Economies as Associate of the General Conference’ tackled a difficult issue because two Associates (Hong Kong (China) and Chinese Taipei) are Economies and their status cannot be changed. Allowing the Caribbean Community (CARICOM) to become an Associate Economy of the CGPM in 2003 was not the best decision and the individual Member States of CARICOM should be encouraged to become States Parties to the Metre Convention. Future applications by Economies to become Associates should be approved by the CGPM. Mrs Perent commented that the draft Resolution provides for granting of the status of Associate of the CGPM on a case-by-case basis and would require unanimity by all States represented at the meeting of the CGPM.

## Draft Resolutions F (F1 to F4)

Mrs Perent commented on Draft Resolution F1 ‘On the exclusion of the Republic of Cameroon’, stating that there have been numerous contacts with the Embassy of Cameroon in Paris. The appropriate authorities in Cameroon have been alerted but so far no official commitment has been received.

Dr Inglis commented that Draft Resolution F2 ‘On the exclusion of the Dominican Republic’ may be withdrawn because of positive feedback indicating that it may enter into a rescheduling agreement with the CIPM. Mrs Perent added that an official letter had been received from the Dominican Republic on 28 September 2011 stating that it will initiate a bank transfer amounting to one year of its arrears. It expects to negotiate a rescheduling agreement over the next 6–10 years and indicated that a first payment would soon be made.

Mrs Perent commented on Draft Resolution F3 ‘On the exclusion of the Islamic Republic of Iran’ that there have been many contacts with representatives from the Islamic Republic of Iran. In August 2011 it informed the BIPM that it wished to remain a State Party to the Metre Convention and that it had initiated a formal domestic procedure to pursue this aim. The Islamic Republic of Iran has asked for Draft Resolution F3 to be withdrawn. In order to do this, the BIPM has recalled that the relevant agenda point of the CGPM meeting would be withdrawn if, by the time of the meeting, a rescheduling agreement has been concluded. So far, no official commitment has been received.

Regarding Draft Resolution F4 ‘On the exclusion of the Democratic People’s Republic of Korea’, there is a new representative for the Democratic People’s Republic of Korea in Paris but he has not received a reply from his government concerning the situation.

Dr Inglis suggested that Draft Resolution F2 ‘On the exclusion of the Dominican Republic’ should be withdrawn. Prof. Uğur warned that States threatened with exclusion may promise to make payments just before the meeting of the CGPM to delay a decision on their exclusion for another four years. Prof. Kühne sympathized with this opinion but stated that three of the four States concerned have expressed their intention to remain States Parties to the Metre Convention. If the Dominican Republic is excluded, the BIPM would probably lose any chance of recovering the arrears it is owed.

Mrs Perent commented that although an undefined payment has been received in 2011 from Cameroon, the context within which this payment had been made was not clear and the agenda point for the 24th meeting of the CGPM regarding the exclusion of Cameroon still stood. Dr Inglis concluded the discussion on Draft Resolution F by recommending that the CGPM be invited by the CIPM not to exclude the Dominican Republic due to recent developments indicating that it may negotiate a rescheduling agreement.

### Draft Resolution G

There were no comments on Draft Resolution G ‘On rescheduling agreements between the International Committee for Weights and Measures and defaulting States Parties to the Metre Convention for the payment of their financial arrears’.

### Draft Resolution H

Prof. Kühne commented that Draft Resolution H ‘On a Convention on the privileges and immunities of the BIPM’ is not a new subject. The carrying of reference materials and scientific equipment through customs for intercomparisons is becoming more difficult and a solution would be for the BIPM to be granted the immunities and privileges such as those granted to other intergovernmental organizations such as the United Nations Organization. Detailed comments on Draft Resolution H have been received from the Japanese government and a number of governments of States Parties to the Metre Convention seem not to be in favour of the Resolution

as proposed. Prof. Kühne proposed that the specific needs of the BIPM are outlined at the meeting of the CGPM together with the rationale for the Convention and the proposal to withdraw Draft Resolution H. He stated that if Draft Resolution H were proposed to the CGPM, a majority vote would be required for adoption. Each of the States Parties to the Metre Convention would then be invited to ratify the Convention. If Draft Resolution H were not adopted, the BIPM would have to negotiate different agreements with each State Party to the Metre Convention, which would not allow the general principle of equal treatment of all Member States of an intergovernmental organization to take its full effect within the BIPM. Dr Tanaka stated that there are many other ways of overcoming the problems associated with carrying reference materials and scientific equipment through customs for intercomparisons. Prof. Kühne commented that many things had been tried so as to overcome the difficulties, but so far, there has been little success. He stated that Draft Resolution H will be presented to the CGPM and withdrawn. A new version will be developed for the following meeting of the CGPM.

#### Draft Resolution I

There were no comments on Draft Resolution I ‘On the revision of the *mise en pratique* of the metre and the development of new optical frequency standards’.

#### Draft Resolution J

There were no comments on Draft Resolution J ‘On the adoption of a common terrestrial reference system’ apart from correction of a minor typographical error.

#### Draft Resolutions K, L, M and N

Draft Resolution N on the role, mission, objectives, long-term strategy and governance of the BIPM was drafted by the CIPM, following the submission of Draft Resolutions K, L and M, presented by Switzerland, the United Kingdom of Great Britain and Northern Ireland, and France respectively. After the circulation of Draft Resolution N, the authors of those three draft Resolutions suggested that the bullet point:

- “to conduct a Review of the role, mission, objectives and strategic direction of the BIPM, including its relationship with Regional Metrology Organizations and NMIs, with a view to developing a long-term Programme of Work and Strategy.”

should be changed to:

- “to conduct a Review of the role, mission, objectives, long-term financial stability and strategic direction of the BIPM, including its relationship with Regional Metrology Organizations and NMIs, with a view to developing a long-term Programme of Work and Strategy.” (emphasis added)

Dr Inglis asked if there were any objections to this change. There were no objections.

It was also suggested that the bullet point:

- “to include in the Review a review of governance arrangements, with representatives of States Parties to the Metre Convention and NMIs, and develop proposals for improvements.”

should be expanded to:

- “to include in the Review a review of governance arrangements, with representatives of States Parties to the Metre Convention and NMIs, and develop proposals for improvements, with the aim to base the governance on direct discussions with representatives of NMIs and States Parties to the Metre Convention.”

Dr Inglis stated that Draft Resolutions K, L and M were duly circulated to all Member States with an introductory note for each Draft and that there seems to be no need for representatives from Switzerland, the United Kingdom of Great Britain and Northern Ireland, and France respectively to make a presentation of their draft to the CGPM. Draft Resolution N will be presented and may allow the discussion to focus on it.

Dr Chung suggested that the title of Draft Resolution N should be changed to reflect the fact that the resolution is more concerned with how the CIPM is run rather than the BIPM.

Prof. Kühne considers it inappropriate to include the aims of the *ad hoc* Working Group on governance in Draft Resolution N as this pre-empts the outcome.



Dr Inglis concluded the discussion on Draft Resolution N by stating that having an alternative text would facilitate the running of the discussions on this matter.

In summary, the situation regarding the Draft Resolutions is as follows:

- Draft Resolution A – the CIPM will propose to the CGPM a correction of a typographical error and the possible addition of an extra sentence.
- Draft Resolution B – no change will be proposed to the CGPM.
- Draft Resolution C – no change will be proposed to the CGPM.
- Draft Resolution D – no change will be proposed to the CGPM.
- Draft Resolution E – no change will be proposed to the CGPM.
- Draft Resolutions F – CIPM would recommend to the CGPM that the agenda point on the exclusion of the Dominican Republic be withdrawn.
- Draft Resolution G – no change will be proposed to the CGPM.
- Draft Resolution H – the CIPM will recommend that the Draft Resolution be withdrawn and a revised version be presented at the next meeting of the CGPM.
- Draft Resolution I – no change will be proposed to the CGPM.
- Draft Resolution J – the CIPM will propose to the CGPM a correction of a typographical error.
- Draft Resolutions K, L and M have been submitted by Member States.
- Draft Resolution N - the bullet point:

“to conduct a Review of the role, mission, objectives and strategic direction of the BIPM, including its relationship with Regional Metrology Organizations and NMIs, with a view to developing a long-term Programme of Work and Strategy.”

will be changed to:

“to conduct a Review of the role, mission, objectives, long-term financial stability and strategic direction of the BIPM, including its relationship with Regional Metrology Organizations and NMIs, with a view to developing a long-term Programme of Work and Strategy.”

Prof. Kühne returned to Draft Resolution A commenting that there is no need to propose a revision of the resolution now because States Parties to the Metre Convention may not understand if a new sentence is added. There will always be diverging views regarding the possible future revision of the SI. Prof. Mills agreed and asked for clarification of the purpose of the proposed extra sentence. Prof. Göbel agreed that Draft Resolution A should not be changed although it would be advisable to be prepared for any concerns expressed during the meeting of the CGPM.

### **5.8 Other remarks on the agenda for the CGPM meeting**

There were no comments on the agenda for the CGPM meeting.

### **5.9 Arrangements for the 24th meeting of the CGPM**

This agenda item will be discussed later in the meeting.

## **6. REPORTS FROM CONSULTATIVE COMMITTEES**

### **6.1 Consultative Committee for Mass and Related Quantities (CCM)**

Dr Tanaka, President of the CCM, presented his report CIPM/2011-34 on the 13th meeting of the CCM, held at the BIPM headquarters on 12–13 May 2011. Most of the CCM Working Groups and both Task Groups had met earlier. Preparations for the possible redefinition of the kilogram are under way and were discussed in the CCM Working Group on Changes to the SI kilogram (WGS1-kg), TG1/WGM and TG2/WGM. Dr Tanaka presented details of the preparations for the proposed redefinition of the kilogram, the work of the CCM Working Groups and progress with key comparisons.

The International Avogadro Coordination completed its 6-year project in March 2011: a successful result for the Avogadro constant was determined for enriched  $^{28}\text{Si}$ ; with correction due to the effect of surface contamination by Cu and Ni, the latest evaluation of  $N_A$  is  $6.022\,140\,82(18) \times 10^{23} \text{ mol}^{-1}$ .

Since the 12th meeting of the CCM in 2010 there have been changes to the chairpersons of three CCM Working Groups. The Executive Secretary of the CCM has changed from Dr Davis to Mr Picard.

Dr Inglis thanked Dr Tanaka for his report and invited questions.

Prof. Kühne commented that Dr Usuda will give a presentation to the CIPM on the planned workshop on Dynamic Measurements for Mechanical Quantities.

Mr Picard stated that a comparison of the official copies and the  $^{28}\text{Si}$  silicon spheres against the international prototype of the kilogram (IPK) will be conducted in 2012 (CCM Recommendation G2 (2010)).

## 6.2 Consultative Committee for Amount of Substance – Metrology in Chemistry (CCQM)

Dr Kaarls, President of the CCQM, gave his report on the 17th meeting of the CCQM, held at the BIPM headquarters on 13–15 April 2011. Seven Working Groups of the CCQM met immediately before the plenary session. A Workshop on Microbiology was held at the BIPM headquarters on 6–7 April 2011. The Workshop focused on food quality and food safety and was attended by 45 people from a wide stakeholder community including food testing laboratories, NMIs, food safety authorities and standardization bodies. It was clear from the discussions that there is little application of metrological principles to food safety and quality. It was unanimously agreed at the workshop that urgent cooperation between the metrology and the microbial food communities is desirable and, as a consequence of this agreement, an *ad hoc* joint steering group, chaired by NIST, will be created to further this aim.

The CCQM discussed at length the proposed redefinition of the mole. Broad agreement within the CCQM regarding the redefinition has been reached, with only one member opposed.

The requirements of NMIs in the field of biosciences were addressed in a study commissioned by the BIPM and delivered by the LGC in the report ‘*Study of Measurement Service and Comparison Needs for an International Measurement Infrastructure for the Biosciences and Biotechnology: Input for the BIPM Work Programme*’.

It was noted that the measurement of moisture in grain and cereals is a critical area because the value of trade depends on the moisture content. The International Organization of Legal Metrology (OIML) has been asked to take a lead in formulating a globally accepted harmonized measurement procedure.

The work of the various CCQM Working Groups was outlined.

Dr Inglis thanked Dr Kaarls for his report and invited questions.

Prof. Göbel enquired if the OIML has the technical competence to examine the issue of moisture in grain. He also asked how frequently the Joint Committee for Traceability in Laboratory Medicine (JCTLM) database is used. Dr Wielgosz replied that the JCTLM database is used approximately 1 000 times per month. He added that there is an issue regarding standards concerning moisture in grain, with the last two standards being written by the International Organization for Standardization (ISO). Dr Kaarls commented that the OIML and ISO could jointly develop a procedure for measuring moisture in grain. Dr Valdés added that INTI and INMETRO have established a Working Group to look into the measurement of moisture in grain because Argentina and Brazil are major grain exporters. Dr Kaarls commented that in principle the NMIs concerned are able to offer traceability in the measurement of moisture in grain once a detailed measurement procedure has been agreed. Dr May added that there is a need to establish the measurand, and Dr Inglis commented that many variables need to be considered, including how to take measurements and where to take the samples from. Dr Wielgosz commented that the measurand is defined by the method, and it is the method/procedure that needs to be identified in detail.

There was a brief discussion on Recommendation Q1 (2011) ‘On the need for further guidance on the expression of measurement results based on counting (enumeration)’. The recommendation was noted by the CIPM and the Consultative Committee for Units (CCU) will be asked to take it forward.

Dr Kaarls presented the Recommendation Q2 (2011) ‘On the need to support established measurement techniques essential to metrology in inorganic chemistry’.

Dr May asked to what extent this Recommendation creates a precedent. Dr Allisy-Roberts stated that the Consultative Committee for Ionizing Radiation (CCRI) faces a similar situation with loss of expertise and will

either issue a similar Recommendation or contact individual NMI Directors to urge them to retain expertise. Dr Kaarls stated that the Recommendation is essential for the CCQM to prevent certain essential communities with specialized expertise from disappearing. Prof. Kühne disagreed, suggesting that if such communities are essential, then why would they disappear. It was agreed not to pursue the matter as an official Recommendation. Instead it will be presented to the next meeting of NMI Directors in 2012.

Dr Quinn thanked the outgoing Chairman, Dr Kaarls, by saying that the CCQM has been a great success since its creation due to the energy and enthusiasm of Dr Kaarls.

### 6.3 Consultative Committee for Ionizing Radiation (CCRI)

Dr Carneiro, President of the CCRI, presented his report CIPM/2011-36 on the recent activities of the CCRI and its three sections. The CCRI held its 22nd meeting on 24 June 2011. The CCRI(I) met on 4-6 May 2011, CCRI(II) met on 21-23 June 2011 and CCRI(III) met on 30 March-1 April 2011. All meetings were held at the BIPM headquarters and most of the eleven CCRI Working Groups met in the days immediately preceding the meetings.

Dr Carneiro focused his presentation on highlights of the work of the CCRI:

- A proposal to establish an international centre for accelerator dosimetry at the BIPM. The proposal is linked to the linear accelerator (linac) project. A report on CCRI strategy that includes the proposal has been submitted to the CIPM.
- Brachytherapy needs specific comparisons. So far, France, Germany, the Netherlands and the United Kingdom of Great Britain and Northern Ireland have taken part in the BIPM piloted comparisons for high dose-rate sources. In the field of mammography there are regulatory concerns about dosage in screening populations and correct delivery; the new BIPM comparisons are fulfilling the needs of NMIs in this field.
- Neutron comparisons are very expensive and an easy target for cost cutting due to reducing industrial uses and the unpopularity of nuclear power in some countries. There were eight participants in the latest neutron fluence comparisons: Brazil, France, Germany, Japan, Russian Federation, the United Kingdom of Great Britain and Northern Ireland, the United States of America and the Institute for Reference Materials

and Measurements of the Joint Research Centre of the European Commission (EC JRC IRMM); while China is arranging a neutron emission comparison with France and the UK.

Dr Carneiro commented that the strategic plan for the CCRI includes the Ionizing Radiation activities of the BIPM Programme of Work for 2013 to 2016. The vision is that the CCRI acts as the global hub for ionizing radiation metrology. This will be achieved through close collaboration and dialogue with institutional stakeholders and end-users.

Dr Carneiro concluded that the CCRI has:

- Consolidated 50 years of accrued knowledge in 3 special issues of *Metrologia*,
- Risen to new challenges in health, the environment and energy,
- Developed a transparent strategic document and improved its governance,
- Active Working Groups and Workshops,
- Achieved healthy renewal of its membership, and
- Met the needs of the ionizing radiation metrology community.

Dr Inglis thanked Dr Carneiro for his report and invited questions.

Prof. Kühne commented that the proposal to establish an international centre for accelerator dosimetry at the BIPM is not mentioned in the Programme of Work for 2013 to 2016 and that it is not timely to include this information in the presentation to the CGPM. The proposal itself provoked much discussion on the concept and the name and Dr Carneiro conceded that the name suggested was perhaps not the most appropriate although it had been selected with a view to raising the profile for additional funding purposes. He agreed, together with Dr Allisy-Roberts that a detailed paper regarding the proposal would be provided for the CIPM. Dr Inglis commented favourably on the proposal and noted that both NMIs and DIs would benefit. He commented that a draft paper should indeed be prepared for discussion at the next meeting of the CIPM in June 2012.

Dr Thomas commented that the CCRI made an important decision on KCs which has made the work of the KCDB much easier. The CCRI decided to stop computing pair-wise degrees of equivalence in KCs. Instead, it just gives the method of calculation. This avoids the need to publish thousands of

numbers and is a major step forwards. Pair-wise degrees of equivalence will be progressively removed from the KCDB as new information is added.

Dr Carneiro recommended the following to the CIPM:

1. Changes in membership:

The CCRI recommends the following changes in membership:

- IAEA to become a member of CCRI(I); it is currently an observer.
- NRPA (Norway) to replace SPRI (Sweden) as an observer in CCRI(I).

2. Maintenance of technical infrastructure:

- CCRI recommends that the CIPM facilitates knowledge preservation, exchange of expertise, and training of specialists in radioactive and non-radioactive sample preparation and, further, that the CIPM actively supports the maintenance of the technical infrastructure necessary for this sample preparation and characterization, through one or more recommendations to the States Parties to the Metre Convention on the importance of this subject.

Dr Inglis noted the proposals on maintenance of technical infrastructure. The NMI Directors will be made aware of the situation at their next meeting on 18 October 2012. Dr Carneiro added that the purpose of the proposal is not to dictate priorities to the NMI Directors instead its purpose is to raise awareness of the situation. He commented that most support for the Recommendation came from a large NMI whose programme of work will be compromised as a result of a proposed closure at another NMI.

## 6.4 Consultative Committee for Electricity and Magnetism (CEEM)

Dr Inglis, President of the CCEM, gave his report on the recent activities of the CCEM and its 27th meeting held at the BIPM headquarters on 17-18 March 2011. There are currently five CCEM Working Groups (WGs). The role of the WGs is regularly reviewed and as a result, two WGs have been closed: the Working Group on ac Quantum Hall Resistance (WGacQHR) and the Working Group on Strategic Planning (WGSP). Both WGs made valuable contributions and fulfilled their mission. Both can be re-established if required.

The CCEM WG on Low-Frequency Quantities (WGLF) and the WG on Radiofrequency Quantities (GT-RF) focused on the key comparison (KC) programmes.

The CCEM WG on Proposed Modifications to the SI (WGSI) focused on the redefinition of units, and in particular the electrical units. Recommendations of the WG were discussed by the CCEM and the resulting position of the CCEM has been incorporated in the final Draft Resolution A. A draft *mise en pratique* for the ampere and other electric units in the SI has been developed.

The CCEM WGSP produced a report to identify the major problems challenging NMIs in electromagnetic metrology in the future, which is available on the BIPM website at <http://www.bipm.org/utis/common/pdf/CCEM-WGSP-2011.pdf>. This document will be of value for strategic planning at the BIPM and in the NMIs. The CCEM considers that in future there will be an increasing need to take a multidisciplinary approach to work programmes, both at the BIPM and in NMIs, with increased emphasis on collaboration, although it is not always clear if the work is being duplicated. A half day Workshop has been proposed for CC Presidents and Executive Secretaries to discuss strategic thinking and to find opportunities for mutual support.

Dr Stock commented that a Task Group had been formed that has proposed some methods of streamlining the review process for CMCs to the CCEM in order to reduce the delay in publication. Dr Thomas suggested that the review process could be eased by dividing the electricity and magnetism field into several categories. She urged the RMOs to use uncertainty tables for CMC claims and she advised stopping computing pair-wise degrees of equivalence in reporting the results of KCs. Dr Inglis commented that the whole CIPM MRA process is mature. Dr Thomas added that when the CIPM MRA was concluded in 1999, the difficulties in maintaining 25 000 CMCs were not anticipated and that it is now necessary to rationalize the work.

Dr Inglis commented that a Task Group has been established to determine the need for a WG to study measurements of electromagnetic properties of materials. The Task Group's initial report indicated that the electrical metrological needs for materials do not require a long-term WG and that the requirements can be addressed through the existing WGs.

Dr Inglis mentioned that the CCEM has been asked to look into the physiological effects of high-voltage ac and dc magnetic fields.



Dr Ittermann, from the Medical Metrology Department of PTB, gave an invited presentation on the physiological effects of magnetic fields, with a particular emphasis on MRI (magnetic resonance imaging) and related safety directives. This started a debate on whether the CCEM should have a role in this field. The idea to support regulatory and advisory bodies will be further explored.

The present and future activities of the Electricity Department were reviewed, particularly the work on the watt balance, the calculable capacitor and the travelling standards. Dr Inglis concluded his presentation by saying that in 2011, for the first time, the CCEM recognized the outstanding and long-term service of two of its former members through the award of BIPM Certificates of Appreciation. The CCEM is pleased to recognize and congratulate Mr Énard from LNE and Dr Bachmair from PTB.

Questions and comments were invited from the members of the CIPM.

Dr Hengstberger commented that the CCEM WGSP had identified in its strategic planning document subject areas that are outside the scope of the CCEM and which come under the umbrella of other CCs e.g. terahertz metrology. He invited discussion forums to be open to outside comments. Dr Hengstberger stated that discussions have begun on ‘few-photon metrology’ within the CCPR and expressed his hope that the CCEM will take note of the findings. Dr Inglis stated that subject areas should not be compartmentalized and the CCEM is keen to collaborate. Dr Stock added that the CCPR Task Group on ‘few-photon metrology’ had met and that a CCEM participant had been invited as a liaison person.

Dr Kaarls welcomed the suggestion to hold a half day Workshop for CC Presidents and Executive Secretaries. He commented that there are many cross-over areas and more coordination is required. Dr Inglis added that the half day Workshop for CC Presidents and Executive Secretaries will be held on the Friday of the CIPM meeting from 2012 onwards.

Dr Quinn stated that the importance of the on-site Josephson and quantized Hall resistance comparisons should be stressed because of the central role the BIPM plays in this. The New SI will increase the need for comparisons and will strengthen the role of the BIPM in this field.

## 6.5 Consultative Committee for Length (CCL)

Dr Sacconi, President of the CCL, stated that the CCL had not met since the last meeting of the CIPM in 2010. He supported the idea of a half day Workshop for CC Presidents and Executive Secretaries.

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

Mr Énard, President of the CCTF, commented that although there had not been a meeting of the CCTF since the last meeting of the CIPM in 2010, there had been considerable activity in the WGs. The CCTF WG on Two-Way Satellite Time and Frequency Transfer (TWSTFT) met in September 2010 in Tsukuba, Japan, and the CCTF WG on Coordination of the Development of Advanced Time and Frequency Transfer Techniques (WGATFT) met in June 2011. The CCTF WG on Strategic Planning (WGSP) has met twice. The 19th meeting of the CCTF will be held at the BIPM headquarters in September 2012.

There are now 68 laboratories from 43 States Parties to the Metre Convention and 8 Associates of the CGPM that contribute data to the BIPM for the calculation of Coordinated Universal Time (UTC).

Improvements in the statistical uncertainty of GLONASS and the calculation of Free Atomic Time (EAL) have been made.

The BIPM plans to test the creation of a more rapidly available UTC version, the “rapid UTC”, as this has been asked for by the Global Navigation Satellite Service (GNSS) community. Prof. Göbel enquired how quick the new ‘rapid UTC’ will be. Dr Arias replied that the system is being tested. Laboratories will have the opportunity to access this new timescale once per week on a fixed day during the test phase.

A special issue of *Metrologia* on Modern Applications of Timescales was published in August 2011.

A Royal Society Discussion Meeting on *UTC for the 21st Century* will be held on 3–4 November 2011 in Chicheley, United Kingdom of Great Britain and Northern Ireland. It will bring together all the principal players involved in the present discussions on how best to meet the needs of all users of time scales.

Dr Arias commented that Draft Resolution J ‘On the adoption of a common terrestrial reference system’ requires a minor modification to the text following discussions with Japanese scientists.

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

The CCAUV has not met since the last meeting of the CIPM in 2010. Prof. Valdés, President of the CCAUV, stated that Dr Picard, the new Executive Secretary of the CCAUV, is doing an excellent job and sends a report every month detailing the work of the CCAUV and which KCs are under way. The CCAUV Working Group for Key Comparisons (CCAUV-KCWG) will introduce new Terms of Reference.

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

The CCPR has not met since the last meeting of the CIPM in 2010. Dr Hengstberger, President of the CCPR, commented for a long time, the focus in photometry has been on the measurement of light under well-lit, photopic, conditions. Very recently, the International Commission on Illumination (CIE) has published a recommended system for mesopic photometry, which is adapted to low, but not quite dark, lighting situations. There are major economic implications involved in the adequate measurement of mesopic light, because 20 % of the electricity generated world-wide is used for lighting. Measurements based on these new models and new technology (LED and fluorescent lighting) may allow very significant energy savings to be made. Energy planners are looking at ways of making savings and metrology will be a key element.

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

The CCT has not met since the last meeting of the CIPM in 2010. Prof. Uğur, President of the CCT, commented on activities of the CCT WGs. They are working on guidance documents, a review of CMCs and the design and supervision of comparisons. A brief outline of work on the redefinition of kelvin was presented. Strategy work within the CCT focuses on finalizing the methodology since the Terms of Reference and the mission statement are adopted.

## 6.10 Consultative Committee for Units (CCU)

The CCU has not met since September 2010. Prof. Mills, President of the CCU, commented that the activities of the CCU since 2010 have been concerned wholly with the new SI. Dr Thomas added that the 'New SI' web pages have been available on the BIPM website since early 2011.

## 6.11 Changes to CC membership

The following changes were approved:

CCRI(II):        IAEA as Member  
                  NRPA as Observer  
                  SSM removed as Observer

CCEM:            CEM as Member  
                  INTI as Member  
                  CENAM as Observer

CCT:             MIKES as Member

Dr Kaarls commented that the Government Laboratory in Hong Kong (China) is seeking Observer status in the CCQM. However, because Hong Kong (China) is an Associate Economy of the CGPM this is currently not possible given the applicable provisions. The Government Laboratory is a significant contributor to the work of the CCQM and it has achieved good results whenever it has participated. Dr Kaarls suggested that the rules of CC membership should be changed to allow Associate Economies that cannot become States Parties to the Metre Convention to become Observers. Prof. Kühne commented that a draft proposal for the change should be submitted to the CIPM. Dr May clarified that the Associates in this situation are Hong Kong (China) and Chinese Taipei. Dr Inglis invited the BIPM to come back with a proposal to change the rules of CC membership for the next meeting of the CIPM in June 2012. If approved, the request from Hong Kong (China) could then be considered.

## 6.12 Timetable of future meetings

CCAUV	11–15 June 2012
CCEM	11–15 March 2013 (Not confirmed)
CCL	17–21 September 2012
CCM	18–22 February 2013 (Not confirmed)
CCPR	21–24 February 2012
CCQM	13–20 April 2012
CCRI	15 May 2012
CCT	21–25 May 2012
CCTF	6–14 September 2012
CCU	11–13 June 2013 (Not confirmed)

The contents of a letter received from Dr Bock, Switzerland, which proposed a change to various procedures within the CCs was discussed. The letter expressed concern about the rules for CCs and the time allowed for document submission. Dr Inglis summarized the discussion by stating that the CIPM reviewed the letter and concluded that the existing rules are sufficient and that at present no updating would be required.

## 7. DEPOSITORY OF THE METRIC PROTOTYPES

The visit to the depository of the metric prototypes at the Pavillon de Breteuil took place at 17:30 on 13 October 2011, in the presence of the President of the CIPM, the Director of the BIPM, and the representative of the Curator of the *Archives nationales*.

The three keys necessary to open the depository were assembled: the key entrusted to the care of the Director of the BIPM, the one deposited at the *Archives nationales* in Paris, brought by Mr E. Rousseau, and finally the one kept by the President of the CIPM.

The doors of the vault and the safe having been opened, the presence in the safe of the international prototype of the kilogram and its official copies was verified.

The following indications were noted on the measuring instruments placed in the safe:

temperature:	19 °C
maximum temperature:	21 °C
minimum temperature:	19 °C
relative humidity:	47 %

The safe and the doors of the vault were then locked.

The Director of the BIPM	For the Curator of the <i>Archives nationales</i>	The President of the CIPM
M. Kühne	E. Rousseau	B.D. Inglis

## 8. REPORT ON THE PRESENT STATUS OF THE CIPM MRA

### 8.1 JCRB report

Mr Altan presented the report CIPM/2011-06 on the recent activities of the JCRB. Since May 2011, the NMIs of Bosnia-Herzegovina, Saudi Arabia and Pakistan have signed the CIPM MRA. As of 13 October 2011 there were a total of 86 NMIs and 138 Designated Institutes from 50 States Parties to the Metre Convention, 33 Associates of the CGPM and 3 international organizations participating in the CIPM MRA. Montenegro became an Associate of the CGPM on 1 August 2011.

Discussions at the 27th meeting of the JCRB held in Vienna, Austria, on 14-15 September 2011 resulted in the following action points:

#### *Rules for Modifying Existing CMCs*

It was noted that rules specified in document CIPM MRA-D-04 for modifying existing CMCs were frequently not observed in the preparation of CMC files submitted for review, causing a loss of time and an increased risk of errors at publication. RMO representatives were requested to remind the Chairs of their technical committees and working groups of the importance of following instructions for modifying existing CMCs established by the JCRB in the guidance documents. (Action 27/1)

*Status of the CMCs of institutes whose designation has been withdrawn*

The JCRB decided that CMCs declared by RMTC of Latvia, whose designation in the area of ionizing radiation was withdrawn by the NMI of Latvia, would be permanently deleted from the KCDB. Furthermore, it was resolved that, henceforth, all CMCs of those institutes removed from Appendix A would be automatically deleted from the KCDB without the need for a separate decision from the JCRB. (Action 27/2 and Resolution 27/1)

*Designated Institutes*

The JCRB discussed the situation of an increasing number of Designated Institutes that are not seen to be sufficiently participating in the activities of the CIPM MRA and about which little is known, leading to questions concerning the appropriateness of their designation. As a result of the discussion, the following measures were agreed:

- The absence of designation area information for a large number of Designated Institutes listed in Appendix A was noted. The BIPM International Liaison Officer and the Executive Secretary of the JCRB will be charged with obtaining this information from the appropriate designating authorities and reporting on the progress of this work at the next JCRB meeting. (Action 27/3)
- The BIPM is charged with drafting a document detailing the expectations from DIs for active engagement in the activities of the CIPM MRA, such as quality system reviews by RMOs, measurement comparisons and declaration of CMCs. During the drafting of this document, the BIPM will use suggestions contained in a document on the subject presented by EURAMET at the meeting. (Action 27/4)

Dr Hengstberger asked if it is necessary to hold two meetings per year given that the activities of the JCRB are now reduced. Prof. Kühne replied that all RMOs consider it useful to continue to meet twice a year. These meetings offer an opportunity to exchange views and ideas.

## 8.2 Recommendations and resolutions from the JCRB

The following recommendations were adopted at the 27th meeting of the JCRB:

- Recommendation 27/1: The JCRB recommends that the CIPM adopt the draft guidelines on the authorship of comparison reports subject to the inclusion of SIM comments.

There were no comments or observations by the CIPM and Recommendation 27/1 was approved by the CIPM.

- Recommendation 27/2: The JCRB recommends to the CIPM to approve the BIPM ILAC Joint Communication on the Accreditation of NMI Services.

Prof. Kühne commented that this recommendation is only for NMIs which seek accreditation. It provides guidelines on how to carry out accreditation and is recommended by all RMOs. Dr Inglis added that Recommendation 27/2 was accepted by all RMOs. Recommendation 27/2 was approved by the CIPM.

- Recommendation 27/3: The JCRB recommends to the CIPM to approve changes to CIPM MRA-D-05 (Measurement comparisons in the CIPM MRA).

Recommendation 27/3 was approved by the CIPM without comment.

## 8.3 KCDB

Dr Thomas, the KCDB Coordinator, presented a summary of the report CIPM2011-07 on the evolution of the KCDB from September 2010 to September 2011. On 26 September 2011, the KCDB included a total of 24 111 CMCs: 15 386 in General Physics, 3 884 in Ionizing Radiation, and 4 841 in Chemistry. The first sets of CMCs declared by Paraguay (23 CMCs in Mass Standards) and Ecuador (20 CMCs also in Mass Standards) were published on 31 January 2011 and 16 September 2011, respectively. Also on 26 September 2011, the database covered 763 KCs (84 from the BIPM, 381 from the CCs, 2 from AFRIMETS, 104 from APMP, 32 from COOMET, 118 from EURAMET, and 42 from SIM), and 280 supplementary comparisons. The KCDB QMS was successfully audited by the BIPM Quality Manager on 18 August 2011.



Prof. Kühne commented that he is very grateful for the work carried out by Dr Thomas and Dr Maniguet on the KCDB and pointed out that it is a core activity within the CIPM MRA.

#### **8.4 Proposed revision of the CIPM MRA**

Prof. Kühne presented a brief summary of the history of the addendum to the CIPM MRA including the changes to international standards and the 2007 agreement by the International Laboratory Accreditation Cooperation (ILAC) to move from the term Best Measurement Capability (BMC) to Calibration and Measurement Capability (CMC). The NMI Directors attending the meeting held at the BIPM on 25 May 2011 agreed in principle that changes be made to the addendum.

The addendum has been duly circulated to all eighty-six signatories for formal approval.

Only thirty-eight signatories have yet replied. Those signatories that have not replied will be invited to do so before the next meeting of NMI Directors in October 2012.

#### **9. JOINT BIPM, OIML, ILAC AND ISO DECLARATION ON METROLOGICAL TRACEABILITY**

Prof. Kühne presented the joint BIPM/OIML/ILAC/ISO declaration on metrological traceability for approval. If the CIPM approves the document, the OIML will follow with approval in November 2011. ISO and ILAC will then approve the document without the need for future meetings.

Dr Inglis thanked Mr Henson for his contribution to the development of the joint document.

Dr McLaren asked about the related ILAC document P10 on traceability that was not approved. Prof. Kühne commented that ILAC document P10 is an internal ILAC document that describes what organizations should do to achieve traceability. He expressed regret that it has not yet been approved by ILAC because it places the CIPM MRA at the top of the traceability chain. A discussion followed on the joint BIPM/OIML/ILAC/ISO declaration on metrological traceability and ILAC document P10. Dr Kaarls commented

that the best solution to the conundrum of metrological traceability is to approve the joint BIPM/OIML/ILAC/ISO declaration.

Dr Inglis called for a vote on the joint BIPM/OIML/ILAC/ISO declaration on metrological traceability. It was accepted by the CIPM with five abstentions: Prof. Göbel, Dr May, Dr Nava-Jaimes, Dr Sacconi and Dr Valdés.

## **10. BIPM/ILAC JOINT WORKING GROUP**

### **10.1 Revision of the ILAC-CIPM MoU**

The original ILAC-CIPM Memorandum of Understanding (MoU) was signed ten years ago. The revised version includes a clear description of the respective role of each party and a few minor amendments to bring the document up-to-date. The revised MoU includes a clause to allow termination of the agreement with six months notice. The document will be signed in November 2011 during the ILAC/IAF Annual Meeting in Bangkok, Thailand.

The CIPM unanimously approved the signing of the revised ILAC-CIPM MoU.

### **10.2 Other actions in progress**

The BIPM will monitor the documents that ILAC produces to determine whether or not the involvement of the BIPM is required.

## **11. CONTACTS WITH OTHER INTERGOVERNMENTAL ORGANIZATIONS AND INTERNATIONAL BODIES**

### **11.1 OIML**

Prof. Kühne presented a report on contacts between the BIPM and the OIML. A new Director of the BIPM, Mr Stephen Patoray, was appointed on 1 January 2011. In addition to the official annual meeting between the BIPM

and the OIML, there is now an informal meeting between the Directors of the BIPM and BIML every three months. World Metrology Day 2011, held on 20 May, was very successful. The World Metrology Day website is hosted by the OIML and the posters are held on the BIPM server. Both organizations express their hope that the excellent cooperation between the BIPM and OIML will continue.

The question of a colocation agreement between the BIPM and the OIML at the BIPM headquarters in Sèvres is ongoing. The BIML has presented the BIPM with a list of rooms and infrastructure needs. The BIPM will reply and present the possibilities available. A detailed concept would require the input of an architect, but at present there are insufficient financial resources to undertake this work. The CIPM agrees that the answer should be provided based on the available internal resources without involving external contract work.

Dr Quinn commented that technical details of a possible colocation are being discussed without fully considering the details. The Pavillon de Breteuil was granted to the BIPM by the government of the French Republic. The responsibility for the headquarters, through the *Accord de Siège*, remains with the BIPM. Prof. Kühne replied that the OIML has not reached a definite decision as to whether or not it intends to relocate. Any colocation would be within the existing buildings at the BIPM headquarters. Any colocation costs would have to be borne by the OIML. A colocation agreement would require the revision of the BIPM *Accord de Siège*. The question remains whether or not the OIML wishes to relocate under the conditions which the BIPM could offer.

## **11.2 WMO, WHO, WTO, CIE, IAEA, IEC, ISO/CASCO, Codex Alimentarius Commission, WADA, pharmacopeias and international forensic bodies, and UNIDO**

### **WMO**

The relationship between the BIPM and the World Meteorological Organization (WMO) is progressing very well, particularly via the CCQM. The WMO-BIPM Workshop on Measurement Challenges for Global Observation Systems for Climate Change Monitoring: Traceability, Stability and Uncertainty in 2010 suggested that there should be closer collaboration between the two organizations. As a result, a joint Working Group that is expected to recommend the establishment of a Joint Committee will meet in

February 2012. The role of the BIPM is to ensure that traceability to the SI is considered the highest priority.

#### WHO

The BIPM maintains good relations with the World Health Organization (WHO) in the field of Ionizing Radiation. Secondary Standards Dosimetry Laboratories (SSDLs) are provided with traceability via the BIPM. The WHO also collaborates with the CCQM.

#### WTO

The BIPM is seeking observer status at the Technical Barriers to Trade (TBT) Committee of the World Trade Organization (WTO). Previously, this has proven difficult due to political decisions within the WTO. This situation has now changed and the BIPM has reapplied. However, it seems clear that observer status would only be granted if WTO TBT Committee members speak up on behalf of applicants.

#### CIE

Dr Hengstberger commented that there is an annual liaison meeting between the International Commission on Illumination (CIE) and the CCPR. The next meeting is scheduled for early 2012.

#### IAEA

The International Atomic Energy Agency (IAEA) participates in the CCRI(I) and is moving from Observer status to full Membership (See section 6.11). The development of a MoU with the IAEA is progressing, albeit slowly. Dr Carneiro commented that the IAEA has good relations with other sections of the CCRI as well as CCRI(I).

#### IEC

There has been little contact with the International Electrotechnical Commission (IEC) since the meeting of the CIPM in 2010.

#### ISO/CASCO

The ISO Committee on Conformity Assessment (ISO/CASCO) is not currently engaged in the review of any subjects of interest to the BIPM.

#### Codex Alimentarius

The BIPM has Observer status in the Codex Alimentarius.

## WADA

Dr Westwood, Principal Chemist within the BIPM Chemistry Department, is a member of the World Anti-Doping Agency (WADA).

## Pharmacopoeias

There is good cooperation between the CCQM Working Group on Bioanalysis (BAWG) and the pharmacopoeias.

## International forensic bodies

The world-wide forensics community has much work to do to improve cooperation among organizations.

## UNIDO

Cooperation between the United Nations Industrial Development Organization (UNIDO) and the BIPM is working well. There is an increase in the metrological infrastructure in Africa as a result of the work of UNIDO. A Metrology School was held in Kenya in February 2011 and was well received. UNIDO is expected to continue with its work to promote the development of metrological infrastructure in Africa.

### **11.3 Letter from the International Association for the Properties of Water and Steam (IAPWS)**

Prof. Kühne received a letter from the President of the International Association for the Properties of Water and Steam (IAPWS) calling for increased cooperation between the BIPM and the IAPWS. The work of the IAPWS is closely linked to climate change modelling and it has ties with the WMO. Many NMIs work with the IAPWS in areas such as the measurement of salinity of oceanic water and efforts continue towards improving traceability. Prof. Kühne suggested that he invite the President of the IAPWS to the BIPM to discuss closer cooperation, a proposal that was endorsed by the CIPM.

## **12. STATES PARTIES TO THE METRE CONVENTION (MEMBER STATES) AND ASSOCIATES OF THE CGPM (ASSOCIATES)**

### **12.1 New Member States and Associates since the last meeting of the CIPM**

Mr Henson presented the report CIPM/2011-23 on the changes in States Parties to the Metre Convention and Associates of the CGPM since Session I of the 100th meeting of the CIPM held in May 2011, and ongoing efforts to increase their numbers. As of the end of September 2011 there were 55 States Parties to the Metre Convention and 34 Associates of the CGPM. The change since the last meeting of the CIPM is the association of Bosnia and Herzegovina on 24 May 2011 and the association of Montenegro on 1 August 2011.

### **12.2 Prospective Member States and Associates**

#### **Africa**

An overview of developments in Africa was presented. There has been much progress under the umbrella of AFRIMETS; however, not all African States are expected to become Associates. Discussions with Namibia about its intention to become an Associate have restarted due to contacts made at the recent meeting of the International Committee for Legal Metrology (CIML). Tunisia, the recently elected chair of AFRIMETS, has indicated that it intends to accede to the Metre Convention, although no formal notification has yet been received.

Dr Hengstberger commented that an EU funded project in Southern Africa could lead to several States becoming Associates. Mr Henson commented that States that wish to become Associates, and which are funded by the UNIDO led technical assistance programmes, need to lodge a letter with the funding body stating that they are aware the financial commitment to the BIPM is for the long term. Dr Hengstberger recalled that UNIDO does not have its own funds available to assist potential Associates; instead it relies on funds from bodies such as the European Union.

## **Middle East**

There are three competing initiatives within the Middle East to establish a Regional Metrology Organization (RMO). The GULFMET initiative (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates and Yemen) is currently focused on capacity building and has indicated that it intends to submit an application to become an RMO. Only Saudi Arabia is currently participating in the activities of the BIPM (as a State Party to the Metre Convention), but applications for Associate status from other States are likely in 2012. Prof. Kühne commented that if that was the case, the JCRB, at its meeting in April 2012, would consider whether to recommend to the CIPM that GULFMET be recognized as an RMO. So far, none of the potential RMOs for the Middle East cover the entire region. Prof. Uğur commented that it may take a long time to establish an RMO that covers the entire region. It may be prudent to start with a smaller RMO which could expand, in a similar way to SADC MET.

The Arab Federation for Metrology (AFM), an ARABMET initiative led by Egypt and which might have included Syria, Yemen, Sudan and Jordan, does not seem to have gained sufficient support and therefore, the plan seems to have been withdrawn.

The Arab Industrial Development and Mining Organisation (AIDMO) has the ambition to eventually establish an RMO including all Arabic countries (in both the Middle East and Africa) and its development is being monitored. AIDMO includes a number of States that participate in AFRIMETS.

In conclusion it seems that currently the GULFMET initiative is one of the most advanced towards the establishment of an RMO.

## **The Americas**

Most States in the Americas are members of SIM. Only nine of the thirty-four members of SIM do not participate in the activities of the BIPM. These are Belize, Colombia, El Salvador, Guatemala, Guyana, Haiti, Honduras, Nicaragua and Surinam. Colombia is actively working towards becoming a Member or possibly an Associate in the future. The remaining countries seem to be rather inactive within SIM.

## **Asia Pacific**

Of the twenty-three full members of the Asia Pacific Metrology Programme (APMP), only four do not participate in the activities of the BIPM: Fiji, Mongolia, Nepal and Papua New Guinea. Brunei Darussalam is considering

joining APMP and is interested in hosting a presentation from the BIPM during World Metrology Day 2012. Dr Inglis enquired if there had been any contact with the authorities in Fiji. Mr Henson replied that there has been no contact, though it was hoped that Fiji would be represented at the forthcoming APMP General Assembly which would provide an opportunity to approach them and possibly start the process in view of its participation to the activities of the BIPM. Dr Hengstberger commented that Bhutan is developing its metrological infrastructure. It has formed an institute and is introducing legal instruments.

### **Eastern Europe and Central Asia**

COOMET has 15 full members and three associates. Of these 18, seven are States Parties to the Metre Convention, six are Associates of the CGPM and the remaining five do not participate in the activities of the BIPM. The latter are Armenia, Azerbaijan, Kyrgyzstan, Tajikistan and Uzbekistan. COOMET is very active in encouraging all States to participate in the activities of the BIPM. Ukraine is an active Associate, with published CMCs, expertise and an NMI, and it is seeking to become a State Party to the Metre Convention. However, Ukraine is undertaking a major restructuring of its Ministries that is expected to delay any plan to accede to the Metre Convention.

Prof. Uğur commented that Uzbekistan is working on a project to become an Associate of the CGPM in 2012 and Turkmenistan has a similar plan for early 2013. Mr Henson replied that Uzbekistan is keen to become an Associate, but that it requires external support.

### **Europe**

Of the thirty-seven States that are members of EURAMET, only three do not participate in the activities of the BIPM: Cyprus, Iceland and Luxembourg. There have been many discussions with Luxembourg and it is believed that it has received final governmental approval to make a request to the BIPM in early 2012. Mr Énard commented that the authorities in Luxembourg are waiting for the outcome of a vote on the State's financial situation in late 2011 before making a final decision. Mr Henson commented that Luxembourg has indicated an intention to become a State Party to the Metre Convention, but does not immediately plan to submit CMCs. This situation may change once it is engaged.



### **Associates of the CGPM meeting the criteria set by the CIPM to be encouraged to become States Parties to the Metre Convention**

The CIPM reviewed the situation of the Associates which have been Associates for at least 5 years on the basis of the criteria it adopted in 2009 and revised in 2010, that is:

- Signature of the CIPM MRA by the Associate State's NMI,
- Publication of comparison results in the KCDB,
- Having one or more CMC listed in the KCDB.

In addition to the existing ten Associates that have met the above criteria (Belarus, Costa Rica, Cuba, Jamaica, Lithuania, Latvia, Panama, Slovenia, Ukraine and Viet Nam) one further Associate, Ecuador, has met the criteria. Ecuador has published twenty CMCs in mass standards. The CIPM formally decided that Ecuador be encouraged to accede to the Metre Convention.

If Draft Resolution D 'On the status of Associate State of the General Conference' is adopted by the CGPM at its 24th meeting, the process for progression from Associate to State Party to the Metre Convention will be reinforced as it would include an automatic and irreversible increase in subscriptions if the criteria for encouragement are met 5 years after the date of accession as Associate.

Dr Inglis thanked Mr Henson for his work in the field of International Liaison.

### **13. JOINT COMMITTEE FOR GUIDES IN METROLOGY (JCGM)**

Prof. Kühne presented the report CIPM/2011-08 on recent activities of the Joint Committee for Guides in Metrology (JCGM). The JCGM has two permanent WGs, one for the International Vocabulary of Metrology – Basic and General Concepts and Associated Terms (VIM) and one for the Guide to the expression of Uncertainty in Measurement (GUM) and its supplements.

There are currently three versions (BIPM, OIML, and ISO) of the 3rd edition of the VIM ("VIM3") as JCGM documents are published individually by the member organizations. In theory, only the covers are different. The CIPM approved the joint publication of the VIM with a joint BIPM/OIML cover.

Concerns have been raised that, in particular, VIM3 is difficult to understand and that users would be unable to work with the document. VIM4 is predicted to be twice as large and even more complex. There is a general feeling that the VIM is losing touch with the metrological community. The CIPM suggested that the VIM WG should investigate the issue of how to make the VIM more understandable.

The members of the CIPM commented that VIM3 is not widely used due to its complexity and that work on VIM4 should be put on hold until the scope for VIM4 could be further discussed. A moratorium of 5 years on the work of VIM was suggested. Prof. Mills backed this suggestion and commented that the GUM may also become too complex. Dr Kaarls commented that there are concerns that the GUM WG is re-writing the document along Bayesian principles.

Dr Inglis summarized the discussion by commenting that the CIPM supports an approach to participating organizations to inform them that the CIPM is of the opinion that the VIM Working Group should cease work for a five year period before readdressing the VIM4 development.

## **14. WORK OF THE BIPM**

### **14.1 Proposed workshop on Dynamic Measurements for Mechanical Quantities**

Dr Usuda gave a presentation on the proposed workshop on Dynamic Measurements for Mechanical Quantities which is scheduled to be held at the BIPM headquarters, provisionally on 15–16 November 2012. There has been considerable improvement in dynamic measurement equipment over the last 25 years and Dr Usuda gave an overview of the progress in various fields and the need for the workshop. He asked the members of the CIPM if they can recommend speakers and highlighted the difficulty of finding speakers from industry due to the confidentiality of information. The aims of the breakout sessions were outlined, as were the expected messages of the workshop. A scientific steering committee has been proposed, consisting of F. Arrhen (SP, Sweden), T. Bruns (PTB, Germany), T. Esward (NPL, United Kingdom of Great Britain and Northern Ireland), J. Filz (LNE, France), N. Fletcher (BIPM), Dr Usuda (AIST, Japan) and J. Wright (NIST, USA).

A brief discussion followed and Dr Inglis commented that there is much interest in the workshop.

#### **14.2 BIPM Director's Report for 2010–2011**

Production of the Director's Report for 2010–2011 will commence in December 2011.

#### **14.3 BIPM Quality Management System**

Prof. Kühne presented the 2011 Annual Report on the Quality Management System (QMS) of the BIPM (document CIPM/2011-19). The focus of activities in 2011 related to improvements to the BIPM QMS and preparations for the global external audit held on 19–21 September 2011. The audit was conducted by Ms Ajchara Charoensook, Head of Electrical Metrology at NIMT, Thailand. The audit found no non-conformities and only one observation and one suggestion were made. The report ended with the conclusion: 'Based on the results of the audit, it is expressed that the BIPM's Quality Management System is fully implemented and committed to the development and continual improvements of its effectiveness. The auditor is impressed with the technical competence of scientists working at the BIPM.'

Successful internal audits were carried out in the Scientific Departments and the Finance, Administration and General Services Department for the activities covered by the QMS, and the KCDB. An external audit was performed in the Chemistry Department on the organic analysis activities (peer reviewer Dr Kim Byungjoo, KRISS, Republic of Korea). No major non-conformities were found.

The CIPM did not make any further comments on the QMS report.

#### **14.4 Health and Safety Report 2011**

Prof. Kühne presented the 2011 Health and Safety Report for the BIPM (document CIPM/2011-21). It was noted that although the BIPM has a Health and Safety manual but it needs to be brought up-to-date to fulfil the requirements of modern management standards. The BIPM Health and Safety Manager, Mr Coelho, is developing a modern Health and Safety

Management System (HSMS) under the guidance of Dr Wielgosz. The HSMS will be similar in structure to the BIPM QMS. In 2011, internal Health and Safety audits took place and reviewed the hazard identification and risk assessments contained in the report of an external audit carried out in 2008. The main purpose of the audits was to verify that the improvement measures initiated by the BIPM had been fully implemented. The audits confirmed that the improvements had been implemented and no major safety issues were encountered. Going forward, a Health and Safety Management Review will be carried out annually.

The CIPM did not make any further comments on the Health and Safety report.

## 15. *Metrologia*

Dr Quinn, the Acting Editor of *Metrologia*, presented a brief summary of the report CIPM/2011-24 on *Metrologia*. He commented that *Metrologia* is an excellent journal and its impact factor of 1.684 for 2010 continues to be higher than those of its competitors. *Metrologia* remains the principal journal in the world for measurement science. The Institute of Physics (IOP) provides the Editor with statistics for downloads of articles from *Metrologia* and a number above 500 for an individual article places it among the top 3 % of all IOP journals. Many articles from *Metrologia* exceed this level.

There were three special issues of *Metrologia* in 2011: International Determination of the Avogadro Constant **48**(2); Modern Applications of Timescales **48**(4); and Neutron Metrology **48**(6). Two special issues are planned in 2012: selected papers from the NEWRAD Conference on radiometry which was held in Finland in September 2011; and papers from a Conference on Metrology in Cancer Therapy to be held at the PTB, Germany, in December 2011.

Dr Quinn commented on the need to have good referees. The BIPM referees' database could be improved by inviting delegates to CCs and WGs to provide a summary of key words describing their individual range of expertise.

Dr Quinn commented that during his term as Acting Editor of *Metrologia* he has not needed to contact the Editorial Board. He suggested that the Editorial

Board be invited to take a more active part in the oversight of *Metrologia*. Dr Quinn suggested that the Editorial board of *Metrologia* should be made up of CC Presidents, plus one or two high level physicists from outside the CC areas. It was suggested that the Editorial board members would meet annually at the BIPM headquarters on the occasion of the meeting of the CIPM.

Dr Inglis thanked Dr Quinn for taking on the role of Acting Editor. He asked the CIPM if they had any thoughts on the proposal that the Editorial Board should consist of CC Presidents. Prof. Kühne commented that the cost of organizing an Editorial Board meeting could be significant, so having an Editorial Board that consists of CC Presidents would allow the Editorial Board meeting to be held back-to-back with the CIPM meeting, thereby reducing the costs to the BIPM.

Dr Inglis asked if there were any Terms of Reference or guidelines for the Editorial Board. Dr Miles commented that there are draft guidelines, based on the model for other IOP journals. Principal roles for Editorial Board members are to encourage the submission of articles to *Metrologia* to give advice on referees and on new fields of metrology for special issues.

Prof. Uğur asked for clarification about how to publish conference proceedings. The proceedings of TEMPMEKO meetings are not published through the IOP and entire conference proceedings are not published in *Metrologia*. Dr Quinn commented that the publication of conference proceedings would depend on cost and the number of pages. The usual procedure is to publish only selected papers in *Metrologia*. Any proposals to publish entire conference proceedings in *Metrologia* would have to be discussed with the IOP.

The presentation on *Metrologia* concluded with a brief discussion of the refereeing process and the contract between the BIPM and the IOP.

## **16. ADMINISTRATIVE AND FINANCIAL AFFAIRS**

### **16.1 States Parties to the Metre Convention in financial arrears**

Mrs Perent presented a report on contributions from States Parties to the Metre Convention that are in financial arrears, noting that the contributions unpaid for up to 3 years amount to about 2.5 million Euros at the time of the

CIPM meeting. This corresponds to approximately 22 % of the total dotation for 2011. This amount relates to unpaid contributions from Brazil, Chile, China, Finland, Israel, Italy, Pakistan, the United States of America, Uruguay and the Bolivarian Republic of Venezuela. Pakistan also has arrears dating from 2009 and 2010. From unofficial information, it was considered unlikely that the United States of America will pay the remainder of its 2011 contributions before the end of 2011. A 9 % shortfall in the dotation for 2011 is forecast due to arrears. Reminders have been sent to all States Parties to the Metre Convention that are in arrears and China and Israel have replied to say that their outstanding contributions will be settled in the near future.

There continue to be four States Parties to the Metre Convention with contributions in arrears for more than 3 years. These States are Cameroon, Dominican Republic, Islamic Republic of Iran and Democratic People's Republic of Korea. The Dominican Republic has contacted the BIPM to confirm that it is working on the details of a rescheduling agreement (see Section 5.7, Draft Resolution F2).

Unsettled subscriptions of Associates of the CGPM currently total about 57 thousand Euros. The unsettled subscriptions are from the Plurinational State of Bolivia, Costa Rica, Cuba, Ecuador, Lithuania, the Former Yugoslav Republic of Macedonia, Sri Lanka, and Zambia.

Dr Hengstberger asked how much of the BIPM annual budget comes from the subscriptions received from Associates to the CGPM. Mrs Perent replied that it totals about 271 thousand Euros in 2011.

## 16.2 Progress report on 2011

Mrs Perent presented the estimated out-turn for 2011 as well as the estimated financial statements for 2011.

### Estimated out-turn for 2011

2011	thousand Euros
Total operating revenue (Estimated):	12 583
Total expenses (Estimated):	11 765
Budget surplus (Estimated):	818

This budget surplus does not include the carry forward of non-committed appropriations to the 2012 budget for an amount of 1 523 thousand Euros. Taking account of this amount, the result would then be a deficit of 705 thousand Euros compared to a budgeted deficit of 1 071 thousand Euros.

Actual revenue would be 338 thousand Euros above the budget of 2011 due to the additional revenue resulting from the accession of Saudi Arabia and from subscriptions from new Associates of the CGPM.

Actual expenses would be 1 971 thousand Euros less than the budgeted figure. This difference is the result, in particular, of three staff positions which were budgeted for but which remained vacant, a saving of 190 thousand Euros in operating expenses and laboratory expenses which were 498 thousand Euros lower than predicted. However, given non-committed appropriations in 2011 carried forward to 2012 for an amount of 592 thousand Euros, laboratory expenses would be higher by 94 thousand Euros than the amount budgeted for.

There would be a carry forward of 663 thousand Euros of non-committed appropriations to the 2012 budget related to building renovations.

### **Estimated financial statements**

The net result (net loss) for 2011 is estimated at -551 thousand Euros. This figure does not include any changes in the 2010 staff provisions.

At the end of 2011 BIPM assets and liabilities are estimated to reach 55 591 thousand Euros and liabilities will total 12 246 thousand Euros respectively. These figures were prepared with no change to the 2010 staff provisions. It is estimated that the Capital Investment Fund would amount to 2 866 thousand Euros at the end of 2011.

### 16.3 Budget for 2012

Prof. Kühne presented the Draft Budget for 2012.

2012 Revenue	Euros
Contributions from Member States	11 814 255
Interest	246 000
Miscellaneous income	139 000
Subscriptions from Associates	279 641
<i>Metrologia</i>	90 100
<b>Total revenue</b>	<b><u>12 568 996</u></b>
2012 Expenses	
Staff expenses	6 560 100
Contribution to the Pension Fund	2 325 000
Operating expenses	1 135 700
Laboratory expenses	1 335 600
Buildings (maintenance and renovation)	640 800
Miscellaneous	90 100
<b>Total expenses</b>	<b><u>12 087 300</u></b>
<b>Budget surplus</b>	<b><u>481 696</u></b>

Prof. Kühne asked for the CIPM to approve the budget for 2012. Following discussion, the budget was approved unanimously.

### 16.4 BIPM staff: promotions, appointments, departures

Since the 99th meeting of the CIPM, Prof. Michael Kühne took up the position of Director of the BIPM on 1 January 2011.



## Promotions

- Mr Alain Picard, previously *adjoint au Directeur du Département des masses*, took up the post of *Directeur du Département des masses* from 1 November 2010, following Dr Richard Davis' retirement.
- Dr Carine Michotte, *physicien* in the Ionizing Radiation Department, was promoted to *physicien principal* from 1 January 2011.
- Dr Joële Viallon, *chimiste* in the Chemistry Department, was promoted to *chimiste principal* from 1 January 2011.
- Dr Ralf Josephs, *chimiste* in the Chemistry Department, was promoted to *chimiste principal* from 1 January 2011.
- Mr Philippe Roger, *technicien principal* in the Ionizing Radiation Department, was promoted to *technicien métrologiste* from 1 January 2011.
- Mr Laurent Tisserand, *technicien* in the Time Department, was promoted to *technicien principal* from 1 January 2011.
- Mr Bruno Vincent, *mécanicien* in the Workshop Section, was promoted to *mécanicien principal* from 1 January 2011.

## Appointments

- Dr Estefanía de Mirandés, previously Research Fellow in the Electricity Department, was appointed Principal Physicist in the Mass Department on 1 November 2010.
- Dr Norbert Stoppacher was appointed Research Fellow in the Chemistry Department from 3 January 2011.
- Mr Thierry Nguyen was appointed IT Officer in the Communication and Information Section from 2 May 2011.
- The appointment of Mr Bruno Coelho as Quality, Health and Safety Manager was extended until 31 December 2012.

## Departures

- Prof. Andrew Wallard retired as Director of the BIPM on 31 December 2010.
- Dr Richard Davis, Director of the Mass Department, retired on 31 October 2010. Dr Davis has been engaged as a Consultant for the BIPM as from 1 November 2010 mainly to give advice and assist on the

process of redefinitions of a number of base units of the SI and the drafting of an appropriate *mise en pratique* for each of them.

- Mr José Sanjaime retired as Head of the Workshop Section on 31 December 2010.
- Dr Michael Petersen, Research Fellow in the Chemistry Department, left on 28 February 2011 at the end of his contract.
- Dr Michael Bradley, Research Fellow in the Electricity Department, left 31 August 2011 at the end of his contract.

## **16.5 Financial Regulations of the BIPM Pension and Provident Fund**

Mrs Perent gave a summary of document CIPM/2011-20, the Draft Financial Regulations of the BIPM Pension and Provident Fund. The Financial Regulations of the Pension Fund are separated from the BIPM Financial Regulations approved by the CIPM in 2009 due to the administrative autonomy of the Pension Fund. The bureau recommended one change to the wording of the document. In Article 1, Paragraph 1.5, the word ‘adopted’ should be changed to ‘established’.

Dr Inglis commented that the Draft Financial Regulations of the BIPM Pension and Provident Fund are intended to provide greater transparency and accountability.

The document CIPM/2011-20, the Draft Financial Regulations of the BIPM Pension and Provident Fund was approved by the CIPM.

## **17. OTHER BUSINESS**

There was a comprehensive discussion of the Draft Resolution N ‘On the role, mission, objectives, long-term strategy and governance of the BIPM’. There was a consensus that Draft Resolution N should be submitted to the CGPM rather than the individual Resolutions submitted by Switzerland and the United Kingdom of Great Britain and Northern Ireland, and France. The possible composition of the *ad hoc* Working Group was discussed. It would represent all the major interest groups and any parties that wish to be represented. With regard to the possible outcome of the review, the CIPM

reminds that the Metre Convention can only be amended via the conclusion of a treaty between all States Parties to the Metre Convention.

### **17.1 Drawing by lot for the renewal of half of the CIPM by the CGPM**

According to Article 8 (1921) of the Regulations annexed to the Metre Convention, election or re-election of half of the CIPM at each meeting of the CGPM shall take place. The list of members subject to renewal would comprise the four members provisionally elected by the CIPM since the last CGPM meeting, namely Dr K.H. Chung (2008), Dr Y. Duan (2009), Dr W.E. May (2008), Dr H.O. Nava-Jaimes (2008).

As there were no current vacancies, the number of CIPM Members to be drawn by lot was 5.

The following names were drawn: Mr L. Énard, Dr R. Kaarls, Dr A. Sacconi, Dr W. Schwitz, and Prof. H. Uğur.

### **17.2 Membership of the bureau of the CIPM**

Prof. Inglis reminded the CIPM that election of the bureau would take place on Friday 21 October 2011, immediately after the closure of the 24th meeting of the CGPM. All four existing members (Dr B. Inglis, Dr R. Kaarls, Dr J.W. McLaren and Dr W.E. May) expressed their willingness to stand for re-election. No other applications were received.

### **17.3 Election of the bureau of the CIPM**

After the renewal of half of the CIPM by the CGPM on 21 October 2011, the CIPM held a short meeting to elect its bureau by secret ballot. The results of these elections are the renewal of each bureau member to his respective position, namely:

- President: Dr B. Inglis,
- Secretary: Dr R. Kaarls,
- Vice-Presidents: Dr W.E. May and Dr J.W. McLaren.

**18. DATE OF NEXT MEETING**

The 101st meeting of the CIPM will be held in two sessions which will take place at the BIPM headquarters on 6–8 June 2012 and 18–19 October 2012.

There will be a workshop of CC Presidents and Executive Secretaries on the afternoon of 8 June 2012.

A meeting of Representatives of States Parties to the Metre Convention is scheduled for 16 October 2012 and a meeting of NMI Directors will be held on 17 October 2012.

Prof. Göbel commented that the PTB, Germany, is celebrating its 125th anniversary on 28 March 2012. This event will be preceded by a symposium on 27 March 2012 entitled '*Metrology, the Universe and Everything*'.

### Pierre Giacomo, 1923 – 2011

Pierre Giacomo was born in Grasse, in the Department of Alpes-Maritimes in the South of France, on 10 February 1923. His father, Joseph Baptistin who died when Pierre was very young, was probably an engineer of the Conservatoire National des Arts et Métiers. His mother, Mathilde Guy was a school teacher. Pierre along with his brother was brought up by his mother and step-father, who was a school teacher in Nogent-sur-Marne not far from Paris. He attended the lycée Voltaire and then the lycée Saint-Louis in Paris from where he entered the *Ecole Normale Supérieure* (ENS) in Paris in 1944. He obtained the Agrégation de Sciences Physiques in 1950 and then a *Doctorat ès Sciences Physiques* in 1955, thus becoming one of the elite among French physicists. In August 1949 he married Jeannine Thauvin, herself a school teacher and graduate of the *Ecole Normale Supérieure de Sèvres* and with an Agrégation de Mathématiques. Jeannine's father Marc was also an engineer of the Conservatoire National des Arts et Métiers. On obtaining his *Agrégation*, Pierre joined a laboratory of the *Centre National de la Recherche Scientifique* (CNRS) at Meudon Bellevue on the western outskirts of Paris. This laboratory had been created by Aimé Cotton in 1927 and became famous for its "*Grand Electro-Aimant de l'Académie des Sciences*" installed in 1928, thus long predating the CNRS, which was created only in 1939. Aimé Cotton died at the age of 82 in 1951 and was succeeded as Director by Pierre Jacquinot (1910-2002) who was to become a great friend and influence on Pierre Giacomo. One of the first acts of Jacquinot was to rename the laboratory the *Laboratoire Aimé Cotton*, an act not without controversy since this was the first of the CNRS laboratories to be given the name of a personality rather than a field of work. Beginning as *stagiaire de recherche* in 1950, Pierre rapidly rose in the hierarchy and by 1955 had become *Directeur adjoint*. By that time he had established his main field of research, under the direction of Jacquinot to be that of the optics of thin reflecting films with particular reference to their use in optical interferometry, a subject he continued to be interested in for the rest of his life. Jacquinot himself laid down the broad aims of the laboratory to cover the whole field of atomic spectroscopy and became renowned by his discovery of Fourier transform spectroscopy. Although Pierre Giacomo's very first scientific paper was not in this field, it was on rapid oscillations of the earth's magnetic field published while he was still at the ENS in 1949, his years from 1951 until in 1967 were full of papers related to thin films, optical interferometry and precise measurements made with optical

interferometers. Many of Pierre's early papers from the *Laboratoire Aimé Cotton* were co-authored with Pierre Jacquinot. With the development of novel instrumentation and the full exploitation of Fabry-Perot and Fourier transform spectroscopy, a large amount of highly accurate spectroscopic data was obtained which, combined with the strong theoretical work of the laboratory, significantly advanced knowledge of atomic structure. Pierre Giacomo's contribution to this was twofold; in the preparation of multilayer dielectric films and in the study of their optical properties. The latter led him to study and obtain a profound understanding of optical interferometry notably in the performance and optimisation of the classic Fabry-Perot interferometer. In the years from 1951 to 1956 he published sixteen papers in this field, three of them in the *Comptes rendus* of the *Académie des sciences*.

In 1957 he left the *Laboratoire Aimé Cotton* and moved some 200 km to the north west of Paris to the city of Caen in Normandy to join the *Faculté des Sciences* of the University of Caen as *Maître de Conférences*. This was a move intended to procure a permanent post in the French university system and to obtain the title *enseignant-chercheur*. He was soon promoted and in 1960 became *Professeur titulaire* de la chaire de physique at the University of Caen. While at Caen he continued his work on optical thin films and interferometry and published a number of papers in collaboration with Emile Pelletier one of his students who subsequently became a long-standing personal friend. During all this period at the *Laboratoire Aimé Cotton* and at Caen Pierre developed a solid reputation in the French world of physics which he subsequently maintained when in 1966 he was called to take the position of *Sous-Directeur* of the *Bureau International des Poids et Mesures* (BIPM) at Sèvres. Among the positions he took in French science, not directly related to metrology, he was *Membre du Conseil de la Société de Physique Française* (1966-1968), *Membre du Comité National de la Recherche Scientifique* (1967-1975) and member of the *Comités de direction* or of the *Comités scientifiques* of a number of French laboratories including the *Laboratoire Aimé Cotton* (1967-1975) and the *Institut d'Optique d'Orsay* (1975-1990) as Vice-President. In 1977 he was made *Commandeur dans l'ordre des Palmes académiques*.

His move to the BIPM in 1966 coincided with a considerable upsurge in work in the field of interferometry following the redefinition of the metre in 1960. Until then the metre had continued to be defined, as it had been by the First General Conference on Weights and Measures (CGPM) in 1889, as the length at 0 °C of the international prototype of the metre made from

Pt-10% Ir and kept at the BIPM. The new definition in 1960 called directly upon all those areas of physics that Pierre Giacomo had worked on. The metre was defined as the length equal to a specified number of wavelengths in vacuum of a particular radiation emitted by an atom of krypton 86. The practical realization of this definition relied upon optical interferometry. The BIPM had of course a long experience in this field going back to the work of A.A. Michelson, J.-R. Benoît (the then Director of the BIPM), Fabry and Perot in the last decade of the 19th and first decade of the 20th centuries when they had used optical interferometry to measure the wavelength of light in terms of the metre. One can probably say that Pierre Giacomo found himself in his element at that time and he participated fully in the work of the BIPM bringing to bear all his experience and deep knowledge of physics. In the years that followed the greatest contribution to the BIPM would be his analytical mind combined with his knowledge of physics applied to metrology. This would be the case not only for work directly related to the metre but to all the scientific work of the BIPM. The 1960s and 1970s were decades when in all the national standards laboratories, as they were then called, modern science was making inroads into what had, in some areas, been metrology still firmly grounded in physics that had remained unchanged for decades. Pierre Giacomo's great strength was his unflagging interest in all that was going on in the laboratories not only of the BIPM but increasingly in the work of the so-called "*grands laboratoires*" namely the *Physikalisch-Technische Bundesanstalt* in Braunschweig and Berlin, Germany, the *National Physical Laboratory* in Teddington, England, and the *National Bureau of Standards* in Washington DC, USA. He soon became a familiar figure at international meetings and in these laboratories as this was the period when international and intercontinental air travel suddenly became not only possible but accessible to the science and metrology community.

On 1 January 1978, with the retirement of Jean Terrien, Pierre Giacomo became the ninth Director of the BIPM. The decade that followed saw the beginning of great changes in the way that international metrology was organized. Instead of world metrology being led essentially by the *grands laboratoires* with the BIPM, an increasing number of smaller countries developed their national standards laboratories and in particular what became known as the regional metrology organizations began to take an important role. In addition, the increasing number of international meetings related to metrology called upon the Director of the BIPM and the *Sous-Directeur* to undertake many more international visits than had been the case in the past. The scientific articles written by Pierre Giacomo in the

years following 1978 reflect this as we see more and more that they were articles based on presentations he had made at international conferences. He was much engaged with yet another redefinition of the metre that took place in 1983 when it became defined no longer as the length of a certain number of wavelengths of light but as the distance travelled by light in a specified fraction of a second. This followed, of course, the development of techniques in the grands laboratoires based on the new science of masers and lasers that allowed a direct measurement to be made of the frequency of optical radiation. Many meetings took place at the BIPM of the Consultative Committee for the Definition of the Metre and Pierre took a full part in these not only as Director of the BIPM but as a highly qualified scientist with a deep knowledge of the physics involved. During this period he became highly respected and made many friends among the top level scientists engaged in this work around the world. The practical realization of the metre at the BIPM had, of course, followed the successive redefinitions and a laser laboratory was built on the site of the former wood workshop and opened in 1984. From then on for the next twenty years a set of helium-neon lasers provided what essentially became the world reference as the practical realization of the metre. It was used intensively for comparisons and calibrations of lasers from practically all the Member States.

Pierre's other great interest outside optics was the International System of Units and everything related to the underlying physics of units. The period from 1960 up until his retirement was one in which much development took place in the understanding of how a practical system of units could be developed. He took a close interest in the work of the Consultative Committee for Units under its first President Jan de Boer and his successor Ian Mills. Matters related to units are not simple and often contain great subtleties and Pierre was a master of these. At the 21st meeting of the CGPM, held at the *Collège de France* in Paris in 1999, he was influential in opposing a draft Resolution that would have put the neper as a derived unit of the SI. He argued successfully that because it was a logarithmic unit, it did not enter into the category of derived units of the SI which by definition had to be obtained as powers of the base units. Corresponding to his interest in units was the great attention he paid to the meaning of language. During his time as Director the use of English in parallel with French at the BIPM increased and he was very vigilant that not only was it necessary that parallel texts in English and French should formally mean the same but that also each one should be elegantly and correctly written. He spent much time on this. He also rendered a great service to the BIPM in taking the Chair of a



small working group made up of representatives of a number of international organizations created to draw up an international bi-lingual French/English vocabulary of basic and general terms in metrology. The first edition of this vocabulary, known as the VIM, was published in 1984. He continued to represent the BIPM in the multitude of meetings that later led to a second edition published in 1993 and in some of the meetings that resulted in the third edition published in 2008.

Among the many activities outside the BIPM, he always took a great interest in French metrology and after retirement in 1988 became, among other activities, President of the *Conseil Scientifique* of the French *Bureau National de Métrologie* from 1992 to 1994. He was among the founders and was first President of an organization in France to promote metrology known as *Metrodiff*. He was elected member of the *Bureau des Longitudes* in 1988 becoming its Vice-President and then President in 1993. He was co-Director in 1976 of the first of a series of Enrico Fermi Schools on Physics devoted to metrology that take place in Varenna on the shore of Lake Como in Italy. After retirement in 1988 he maintained his interest in metrology remaining a familiar figure at the BIPM and taking part as Directeur Honoraire in meetings of the Comité International des Poids et Mesures as well as being present at the five General Conferences that have taken place since. In 1990 he was made a *Chevalier de la Légion d'Honneur*.

As Director, Pierre Giacomo took a great interest in the careers and welfare of his staff and was always ready to discuss not only their scientific or laboratory work but also any other matters. He was very conscious of the need for the BIPM to attract and keep highly qualified scientific staff from countries all over the world and was very sympathetic to moves to make it more attractive for scientists from outside France to come with their families to work at the BIPM.

Pierre was a gentle man in the best sense of the word, was well liked and respected. He died on 29 June 2011 just one week after the death of Jeannine his wife of more than sixty years.

Terry Quinn, Emeritus Director BIPM



## LIST OF ACRONYMS AND INITIALISMS USED IN THE PRESENT VOLUME

AFM	Arab Federation for Metrology
AFRIMETS	Inter-Africa Metrology System
AIDMO	Arab Industrial Development and Mining Organisation
AIST	see NMIJ/AIST
APEC	Asia-Pacific Economic Cooperation
APMP	Asia Pacific Metrology Programme
ARABMET	Arab Metrology Programme
BAWG	CCQM Working Group on Bioanalysis
BEV	<i>Bundesamt für Eich- und Vermessungswesen, Vienna (Austria)</i>
BIML	International Bureau of Legal Metrology/ <i>Bureau International de Métrologie Légale</i>
BIPM	International Bureau of Weights and Measures/ <i>Bureau International des Poids et Mesures</i>
BMC	Best Measurement Capability
CARICOM	Caribbean Community
CC	Consultative Committee
CCAUV	Consultative Committee for Acoustics, Ultrasound and Vibration/ <i>Comité Consultatif de l'Acoustique, des Ultrasons et des Vibrations</i>
CCEM	Consultative Committee for Electricity and Magnetism/ <i>Comité Consultatif d'Électricité et Magnétisme</i>
CCL	Consultative Committee for Length/ <i>Comité Consultatif des Longueurs</i>
CCM	Consultative Committee for Mass and Related Quantities/ <i>Comité Consultatif pour la Masse et les Grandeurs Apparentées</i>
CCPR	Consultative Committee for Photometry and Radiometry/ <i>Comité Consultatif de Photométrie et Radiométrie</i>
CCQM	Consultative Committee for Amount of Substance/ <i>Comité Consultatif pour la Quantité de Matière</i>

CCRI	Consultative Committee for Ionizing Radiation/ <i>Comité Consultatif des Rayonnements Ionisants</i>
CCRI(I)	Section I of the CCRI
CCRI(II)	Section II of the CCRI
CCRI(III)	Section III of the CCRI
CCT	Consultative Committee for Thermometry/ <i>Comité Consultatif de Thermométrie</i>
CCTF	Consultative Committee for Time and Frequency/ <i>Comité Consultatif du Temps et des Fréquences</i>
CCU	Consultative Committee for Units/ <i>Comité Consultatif des Unités</i>
CEM	<i>Centro Español de Metrología</i> , Madrid (Spain)
CENAM	<i>Centro Nacional de Metrologia</i> , Querétaro (Mexico)
CGPM	General Conference on Weights and Measures/ <i>Conférence Générale des Poids et Mesures</i>
CIE	International Commission on Illumination/ <i>Commission Internationale de l'Eclairage</i>
CIML	International Committee for Legal Metrology/ <i>Comité International de Métrologie Légale</i>
CIPM	International Committee for Weights and Measures/ <i>Comité International des Poids et Mesures</i>
CIPM MRA	CIPM Mutual Recognition Arrangement
CMC	Calibration and Measurement Capabilities
Codex Alimentarius:	Commission under the Joint FAO/WHO Food Standards Programme
COOMET	Euro-Asian Cooperation of National Metrological Institutions
EAL	Free Atomic Time Scale/ <i>Échelle Atomique Libre</i>
EC JRC IRMM	Institute for Reference Materials and Measurements of the Joint Research Centre of the European Commission
EURAMET	European Association of National Metrology Institutes
FDA	Food and Drug Administration (United States of America)
GLONASS	Global Navigation Satellite System
GNSS	Global Navigation Satellite Service
GT-RF	CCEM WG on Radiofrequency Quantities

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GULFMET	Gulf Association for Metrology
GUM	Guide to the Expression of Uncertainty in Measurement
HSMS	Health and Safety Management System
IAC	International Avogadro Coordination
IAEA	International Atomic Energy Agency
IAF	International Accreditation Forum
IAPWS	International Association for the Properties of Water and Steam
ICRU	International Commission on Radiation Units and Measurements
ICTNS	Interdivisional Committee on Terminology, Nomenclature and Symbols
IDF	International Dairy Federation
IEC	International Electrotechnical Commission
ILAC	International Laboratory Accreditation Cooperation
INMETRO	<i>Instituto Nacional de Metrologia, Normalização e Qualidade Industrial</i> , Rio de Janeiro (Brazil)
INTI	<i>Instituto Nacional de Tecnología Industrial</i> , Buenos Aires (Argentina)
IOMP	International Organization for Medical Physics
IOP	Institute of Physics
IPK	International prototype of the kilogram
IPSAS	International Public Sector Accounting Standard
ISIRI	Institute of Standards and Industrial Research of Iran
ISO	International Organization for Standardization
ISO/CASCO	International Organization for Standardization, Committee on Conformity Assessment
IUPAC	International Union for Pure and Applied Chemistry
JCDCMAS	Joint Committee on Coordination of Assistance to Developing Countries in Metrology, Accreditation and Standardization
JCGM	Joint Committee for Guides in Metrology
JCRB	Joint Committee of the Regional Metrology Organizations and the BIPM
JCTLM	Joint Committee for Traceability in Laboratory Medicine

KC	Key Comparison
KCDB	Key Comparison Database
KCWG	CCAUV Working Group for Key Comparisons
KRISS	Korea Research Institute of Standards and Science, Daejeon (Republic of Korea)
LED	Light emitting diode
LGC	LGC, <i>formerly</i> Laboratory of the Government Chemist (United Kingdom)
Linac	Linear accelerator
LNE	<i>Laboratoire National de Métrologie et d'Essais</i> (France)
METAS	Federal Office of Metrology, Wabern (Switzerland)
MIKES	<i>Mittatekniiikan Keskus</i> /Centre for Metrology and Accreditation, Helsinki (Finland)
MoU	Memorandum of Understanding
MRI	Magnetic resonance imaging
NEWRAD	Conference on New Developments and Applications in Optical Radiometry
NIMT	National Institute of Metrology (Thailand)
NIST	National Institute of Standards and Technology, Gaithersburg MD (United States of America)
NMI	National Metrology Institute
NMIJ/AIST	National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (Japan)
NMO	National Measurement Office (United Kingdom of Great Britain and Northern Ireland)
NPL	National Physical Laboratory (United Kingdom of Great Britain and Northern Ireland)
NRPA	Norwegian Radiation Protection Authority (Norway)
OIML	International Organization for Legal Metrology/ <i>Organisation Internationale de Métrologie Légale</i>
PTB	<i>Physikalisch-Technische Bundesanstalt</i> , Braunschweig and Berlin (Germany)
QMS	Quality Management System
RMO	Regional Metrology Organization

RMTC	Radiation Metrology and Testing Centre (Latvia)
SADCMET	Southern African Development Community Cooperation in Measurement Traceability
SI	International System of Units/ <i>Système international d'unités</i>
SIM	<i>Sistema Interamericano de Metrología</i> /Inter-American Metrology System
SP	<i>Sveriges Tekniska Forskningsinstitut</i> /Technical Research Institute of Sweden, Borås (Sweden)
SPRI	Swedish Institute for Health Services Development (Sweden)
SSDL	Secondary Standards Dosimetry Laboratories
SSM	<i>Strål säkerhets myndigheten</i> /Swedish Radiation Safety Authority, Stockholm (Sweden)
TAI	International Atomic Time/ <i>Temps atomique international</i>
TBT	Technical barriers to trade
TG	Task Group
TWSTFT	Two-Way Satellite Time and Frequency Transfer
UNIDO	United Nations Industrial Development Organization
UTC	Coordinated Universal Time/ <i>Temps universel coordonné</i>
VIM	International Vocabulary of Metrology
WADA	World Anti-Doping Agency
WG	Working Group
WGacQHR	CCEM Working Group on ac Quantum Hall Resistance
WGATFT	CCTF Working Group on Coordination of the Development of Advanced Time and Frequency Transfer Techniques
WGLF	CCEM WG on Low-Frequency Quantities
WGM	CCM Working Group on Mass Standards
WGSI	CCEM WG on Proposed Modifications to the SI
WGSI-kg	CCM Working Group on Changes to the SI kilogram
WGSP	Working Group on Strategic Planning
WHO	World Health Organization
WMO	World Meteorological Organization
WTO	World Trade Organization